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CIO

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DECEMBER 1, 1997

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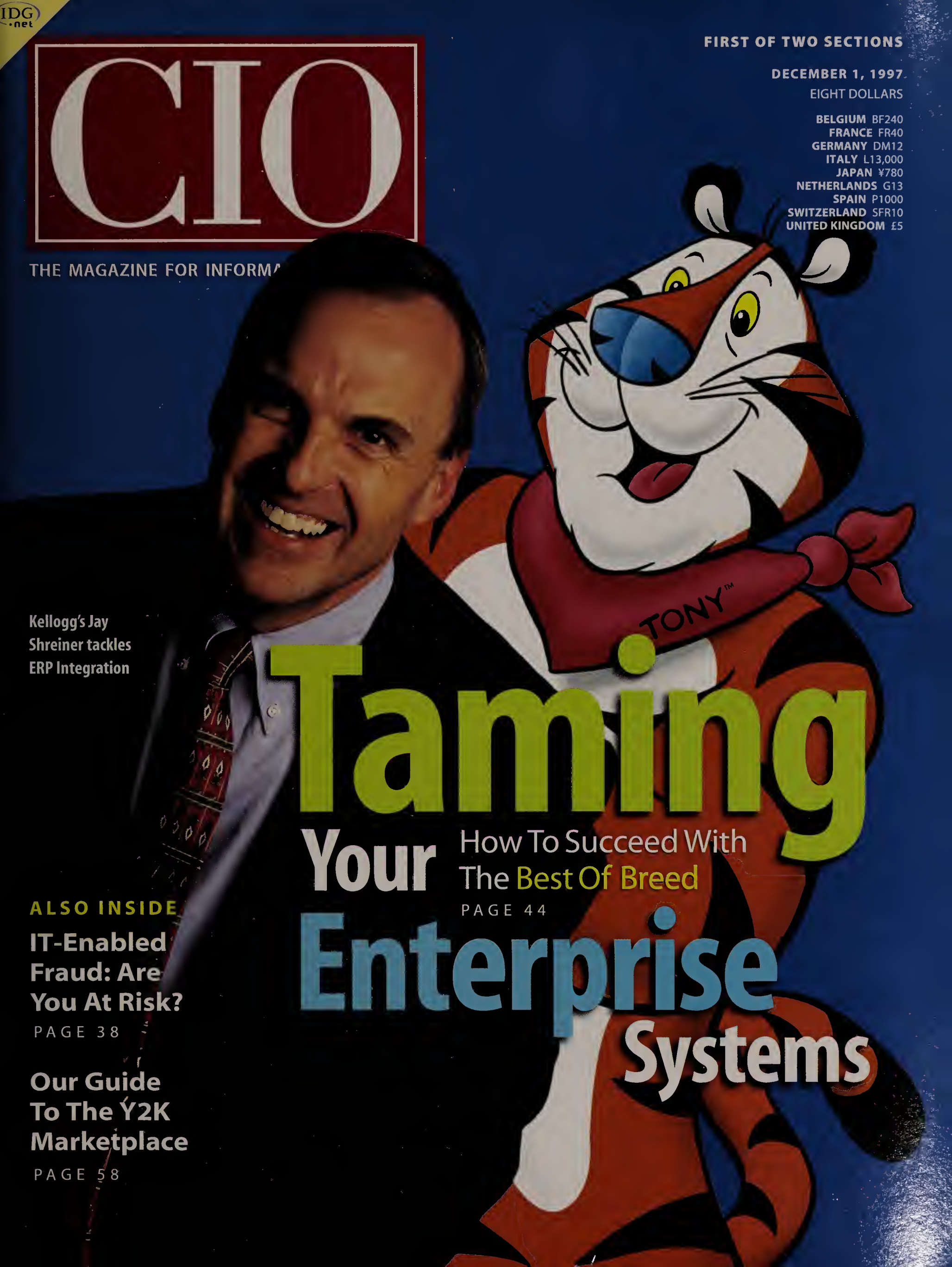

Kellogg's Jay Shreiner tackles ERP Integration

Taming Your Enterprise Systems

How To Succeed With The Best Of Breed

PAGE 44

ALSO INSIDE

IT-Enabled Fraud: Are You At Risk?

PAGE 38

Our Guide To The Y2K Marketplace

PAGE 58

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VOL. 11 • NO. 5 • DECEMBER 1, 1997 • 190 PAGES IN 2 SECTIONS
SECTION 1

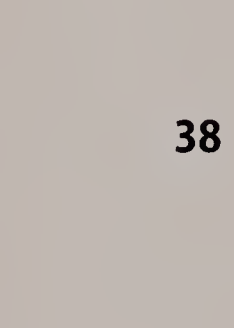
Features

38 Eye Opener
INTERVIEW: MALCOLM SPARROW CIOs, bent on wringing operational efficiencies from their IT investments, may have become oblivious to the side effects of their success. *By David Pearson*

44 Crossing No Man's Land
COVER STORY: ENTERPRISE APPLICATIONS Successfully smuggling information across the no man's land between enterprise software packages can have more bottom-line impact than the applications themselves. *By Christopher Koch*

58 Get the Right People On Board
YEAR 2000 CHALLENGE Your year 2000 project is unlike any other IT undertaking. You can't move the deadline, you're in the spotlight and all the other companies on the planet are racing to fix their systems at the same time. *By Scott Kirsner*

70 The Year in Review
STORY INDEX An index of all major articles published in *CIO* in 1997, including a cross-reference by article type.



ON THE COVER:

Why shouldn't a computer system reflect the business it serves?

–Kellogg's CIO Jay Shreiner

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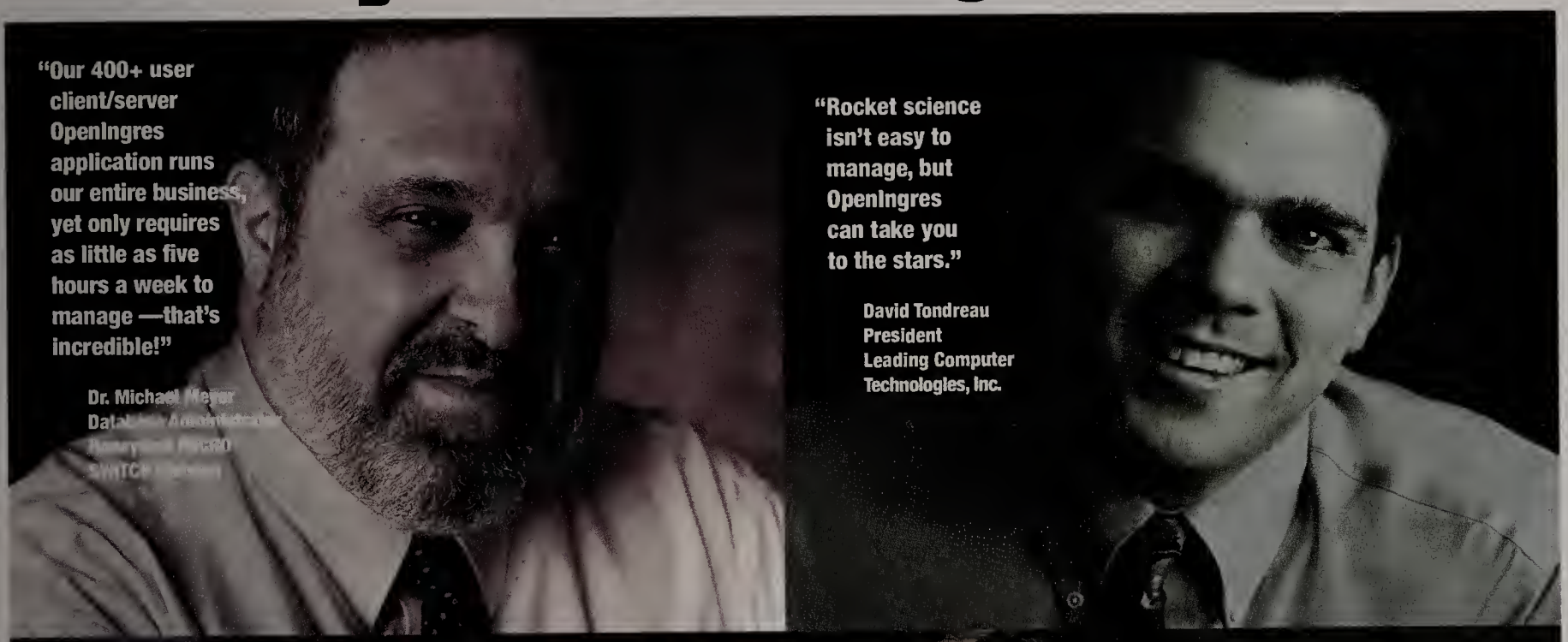

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20

Columns

32 Not-So-Secret Agenda

EXECUTIVE COUNSEL Bag the tech talk. Successful meetings require planning, practice and plain English. *By Eric Torbenson*

84 Network Computers

EMERGING TECHNOLOGY The skinny on the thin client revolution. *By Paula Jacobs*

Smart cards • Desktop video • Online learning • Web deployment system

96 Iowa's Public Defender's Office

WORKING SMART An automated payment and data collection system reduces data entry by 60 percent. *By Ruth Greenberg*

In Every Issue

12 In Box

Letter from the editor, reader feedback and how to reach us • New on our Web site

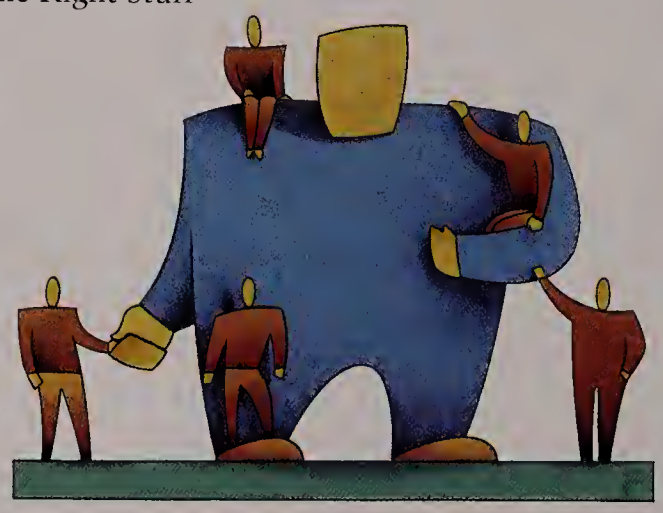
16 Publisher's Note

20 Trendlines

Gifts for the Technofile • A Final Farewell • Words from the Wise • Net Safety • Ten Years Ago in *CIO* • Access for Everyone • The Right Stuff

92 Portfolio

94 Index



84

Inside Section 2

COVER STORY: MILITARY INTRANET The U.S. Atlantic Command's intranet gives everyone access to the same information.

INTERNATIONAL BUSINESS How to host a Web site in cultures you don't know.

SALES AND DISTRIBUTION Music fans don't have to go to a record store to buy CDs. Next year, they won't have to buy CDs.

NETREPRENEURS Liquid Audio's Web-enabled music distribution is designed to quiet music industry fears.

GRAY MATTERS In Web commerce, traditional assumptions about privacy are becoming old-fashioned notions.

CUSTOMER INTERFACE Winning the search-engine game requires keeping a few tricks up your sleeve.

THE MAIN ATTRACTION Can corporate players be convincing—or successful—in the communitarian role?

POWER SOURCE Make sure your users don't become pawns of unsophisticated search techniques.

BY REDESIGN Epson took a good page and made it great.

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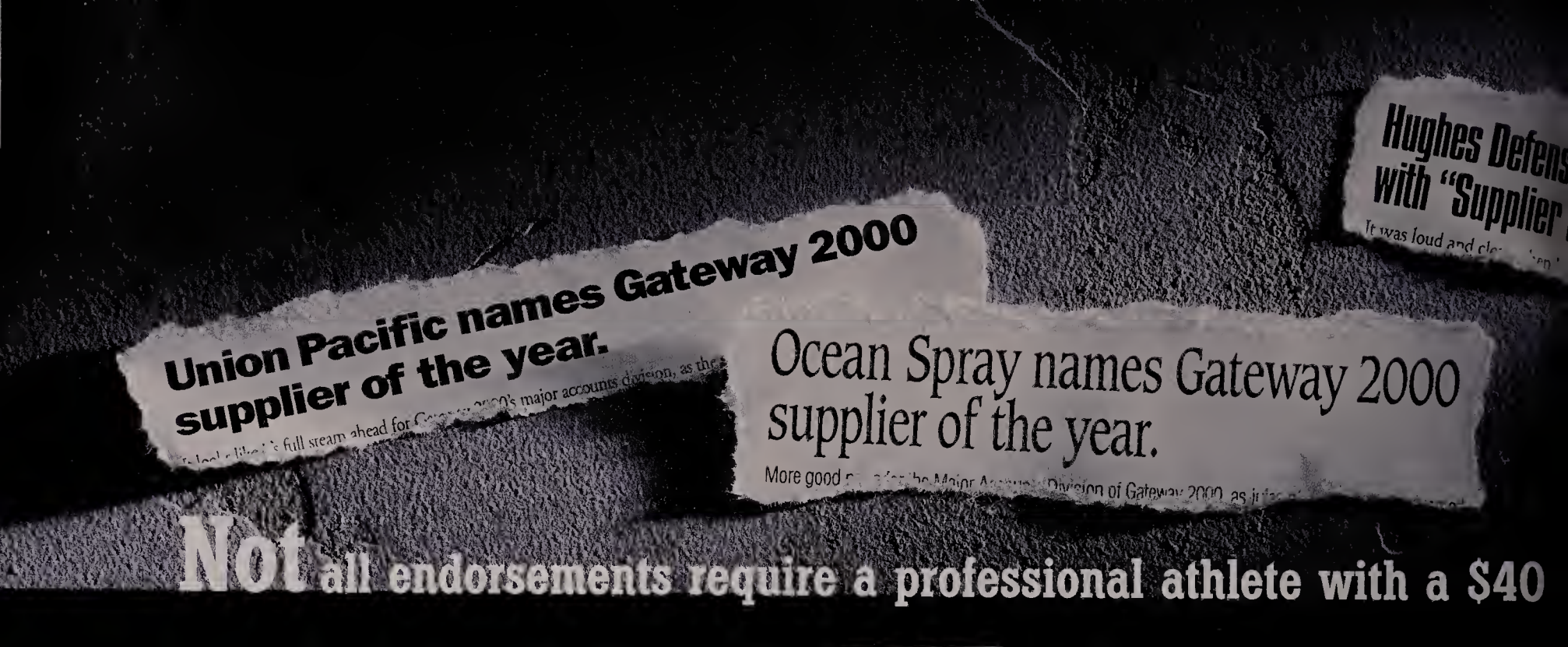

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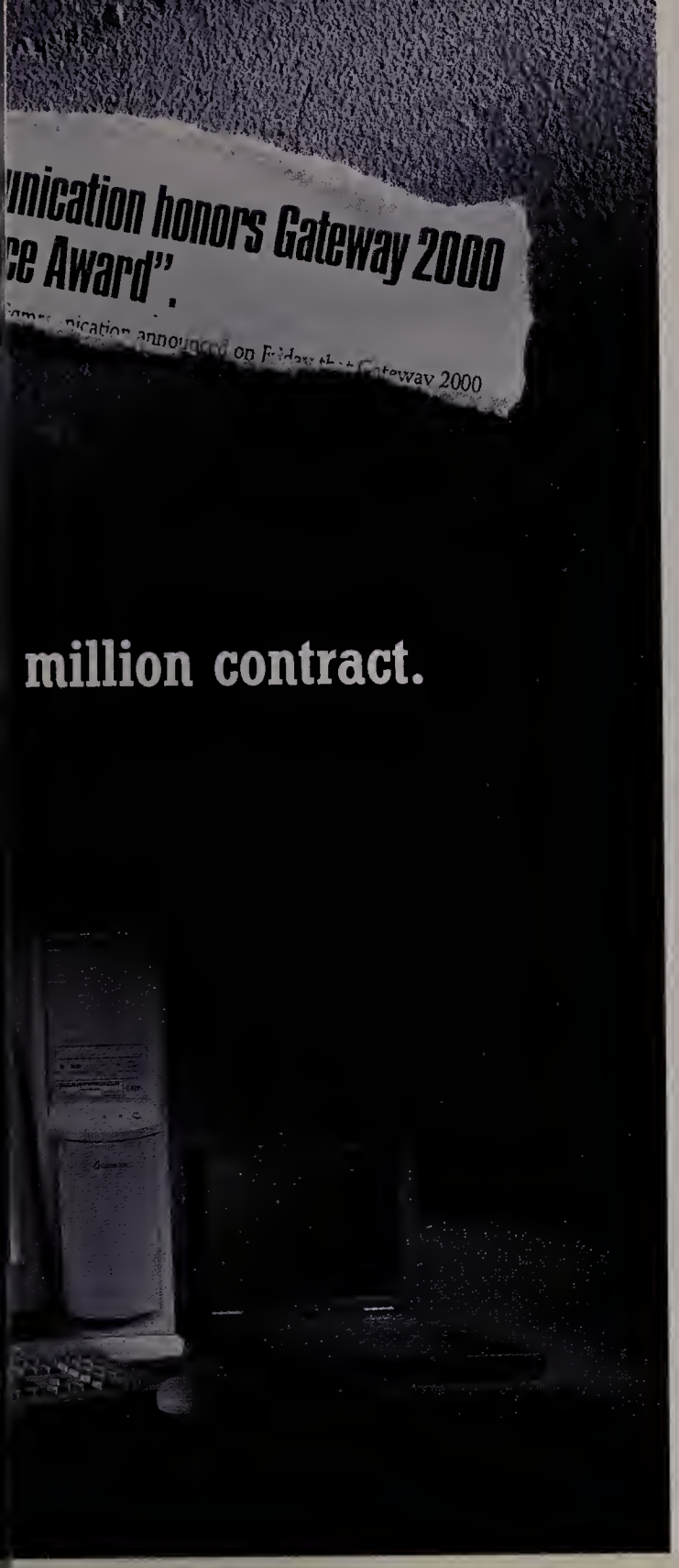

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In Box

LETTER FROM THE EDITOR, READER FEEDBACK AND HOW TO REACH US

On an airplane, again—from San Antonio this time. Missed the Alamo, but I got to take a stroll along the River Walk. I was attending the partnership luncheon at the annual conference of the Hispanic Association of Colleges and Universities (HACU; *www.hacu2000.org*). I was there to present a scholarship check on behalf of *CIO* and Intel Corp. as part of our Leaders of the Information Age scholarship program. (See Page 136 of the Sept. 15, 1997, issue.)

It was an impressive gathering, with over 650 teachers and administrators from Hispanic-supporting institutions. Among those on the dais with me were U.S. Secretary of Agriculture Dan Glickman; San Antonio Archbishop Patrick Flores; Gil Medeiros, chief of the CIA's Recruitment Center; and Carlos Cantu, president and CEO of The ServiceMaster Co.

In presenting the scholarship check (and yes, I had one of those *big* checks, just like on TV), I explained that *CIO* is recognizing today's technology leaders as well as helping to cultivate future leaders. So much of the change taking place in business and society is the result of the vision and passion of people like Andy Grove, Larry Ellison and Charles Wang. For organizations to thrive in the future, those of us in positions of influence must do whatever we can to help cultivate our future leaders—the people who will take all this potential and bring it home.

I thought I'd be the only one talking about information technology at this gathering. I couldn't have been more wrong. The CIA's Medeiros spoke about the state-of-the-art payroll system an HACU intern developed at the CIA. Secretary Glickman boasted of a federal government first: an intranet created at the Department of Agriculture by another HACU intern. ServiceMaster CEO Cantu spoke about knowledge and technology—and offline mentioned that he's creating a central CIO position to coordinate the company's many decentralized operations.

Given the current IS staffing crisis (which will be the focus of the next issue of *CIO*), it behooves more companies and government agencies to partner with educational organizations such as HACU. Because you need their collaboration at least as much as they need yours.

lundberg@cio.com

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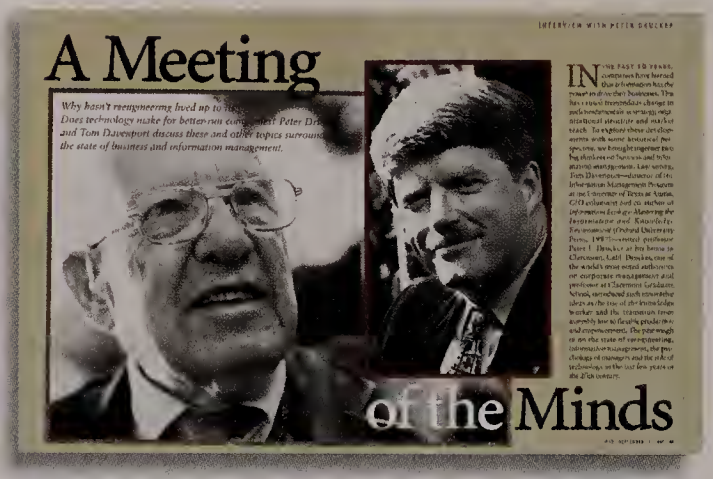
In Box

GET BACK TO THE FUTURE

Tom Davenport's fascinating interview of Peter Drucker ["A Meeting of the Minds," Sept. 15, 1997] was evocative of several themes of failure in many management teams. While his focus on the importance of information about the outside world seems right, Drucker doesn't go far enough when he urges managers to seek the latest outside information.

We should focus on identifying the areas of greatest uncertainty. Drucker's description of the clothes retailer who went out of business because he couldn't foresee the importance of ready-to-wear suits is a case in point. Ironically, Drucker's retailer failed by following one of today's management mantras: Be sure your business is customer-driven. In many cases, a company's customers may not be the people to look to for new business trends. We doubt that the retailer's customers accepted the first version of ready-to-wear. However, other people were attracted by the lower costs, resulting in the creation of a ready-to-wear business that eventually absorbed the customer base of the retailer.



The trends that are often the most important to businesses are outside their walls—maybe even outside their industries—and are changing. We need to look for those areas that are most sensitive to change and find ways to anticipate the changes. There is no silver bullet to do this, but some forms of business intelligence, trend analysis and technology tracking can help. Approaches to planning that are firmly focused on uncertainties in the future, like scenario-based planning, can also help management teams think about the impact that future changes in the outside world could have on their companies.

Charles M. Perrottet
Vice President
The Futures Group Inc.
Glastonbury, Conn.
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THE RIGHT CALL

Your cover story describing call centers as "white hot" ["Fast Fone Farms, Fat Profits," Oct. 1, 1997] was a pleasure to find at the end of a typically long day running one of those "fone farms." As the director of teleservices at Montefiore Medical Center in the Bronx, I am forever reinforcing the notion that customer service will differentiate competitors. Our own off-site call center was conceptualized by health-care executives who fully realized that and decided to "insource" this vital link to our customers—the patients—who count on us to help navigate the complexities of today's health-care environment. In this not-for-profit industry in New York, there's no more fat—just the hard work necessary to maintain a reputation of medical excellence, concern for people and convenient access. Our customer strategy is to build a lifetime of "moment of truth" contacts.

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Publisher's Note

"What we need to do is understand the relationship between humans and technology and how they should work together to produce effective fraud control."

–Malcolm K. Sparrow
Lecturer in Public Policy
John F. Kennedy School of Government
Harvard University

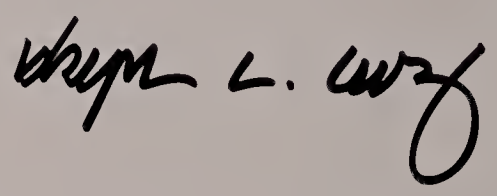
If you knew you could get away with it, would you commit fraud?

If you answered "no," you're more honest than the thousands of individuals who commit health-care billing fraud each year. These perpetrators manipulate the system simply because they are quite sure they will not be caught. Why is this? "Most CIOs I've met are naive about the vulnerability of their systems," says Malcolm K. Sparrow. "They seem totally devoted to processing efficiency and the application of technology toward that end. Certainly most don't want to hear about exceptions handling and holding up payments, or anything else that might threaten to knock a hole in their achievements."

Health care is not the only industry that needs to be mindful of fraud perpetrators. Defrauders swindle nearly $100 billion from private and government payers across the United States each year. For this reason, CIOs in every industry must find a way to integrate the competing priorities of safeguards and processing efficiency.

Senior Writer David Pearson explores these competing priorities in an interview with Sparrow in "Eye Opener" on Page 38. Sparrow, author of *License to Steal: Why Fraud Plagues America's Health Care System*, speaks candidly about the high price of paying too much attention to productivity and too little to fraud control. In an era where automation may inadvertently open the door to swindling, CIOs need to be aware that fraud control is one part of the process that can't be automated.

I hope you will enjoy reading Pearson's article as well as the rest of our Dec. 1 issue. As always, I look forward to receiving your comments and suggestions regarding future topics you'd like to see covered in the pages of *CIO* and/or online. Please e-mail me at *jlevy@cio.com*.



P.S. Please be sure to join us Feb. 1-4 at our 1998 Enterprise Value Retreat at the Ritz-Carlton Laguna Niguel in Dana Point, Calif. For more information, visit our Web site at *www.cio.com* or call us at 800 355-0246.

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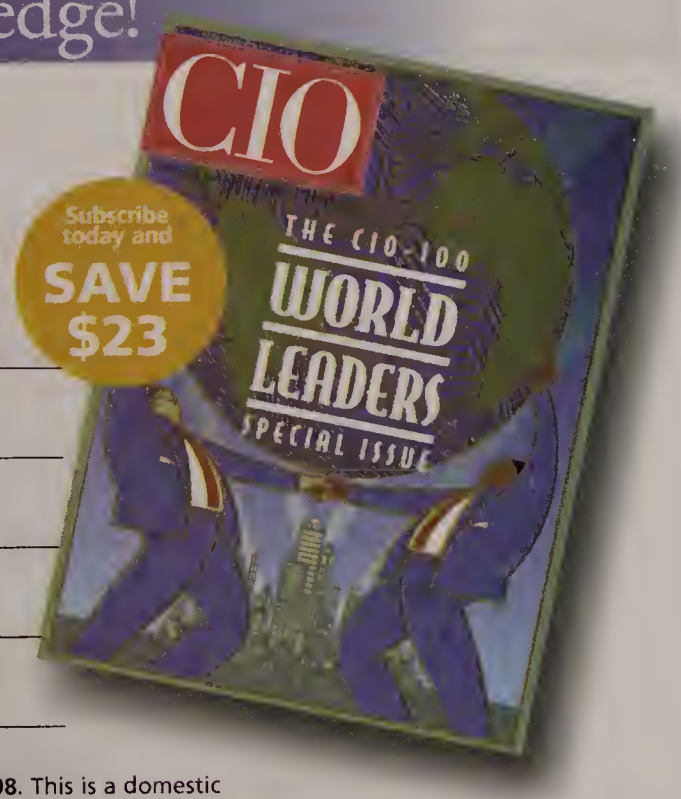

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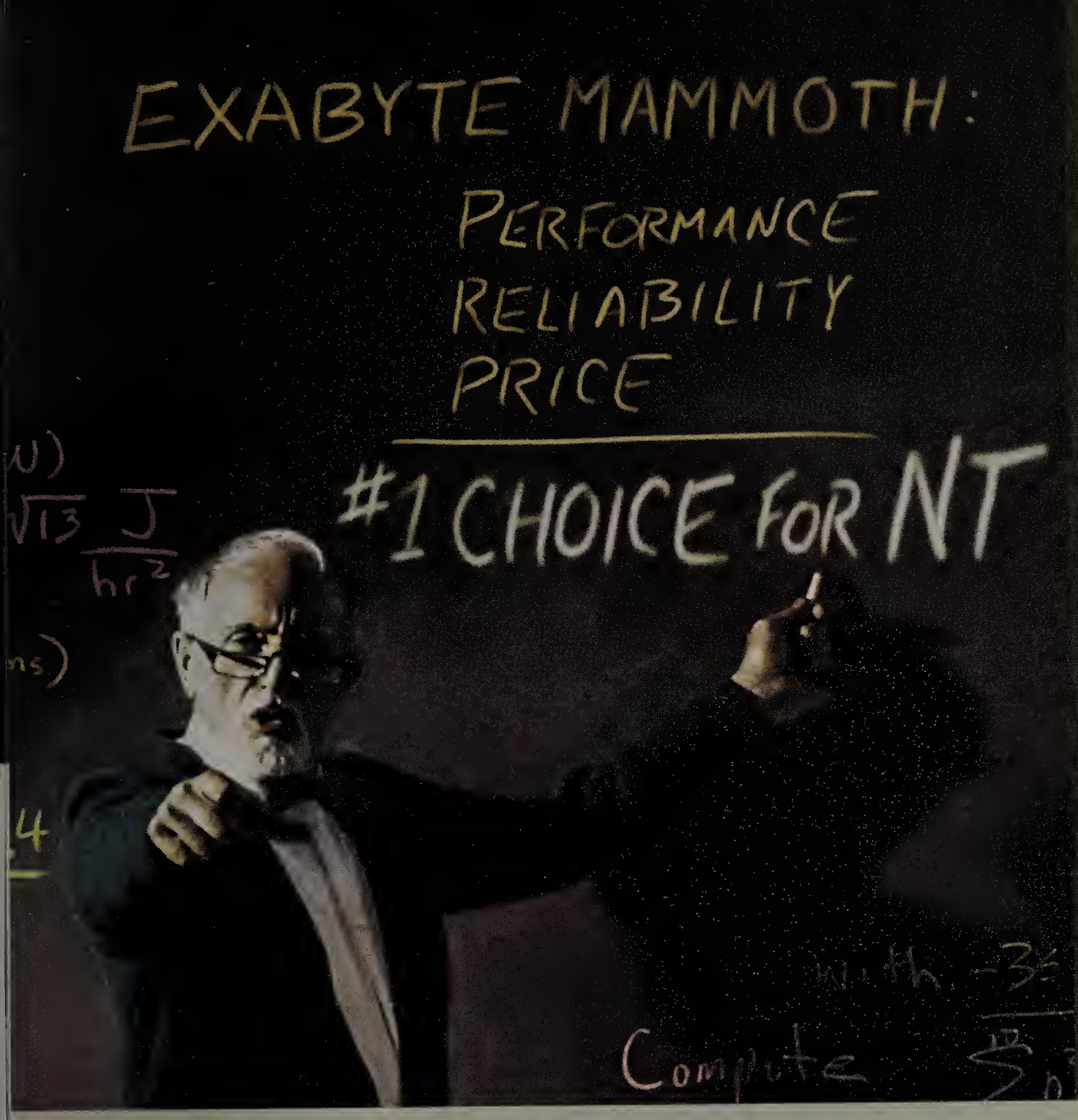

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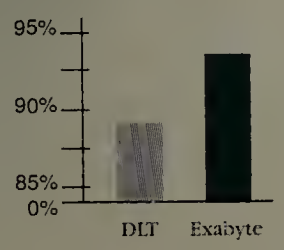

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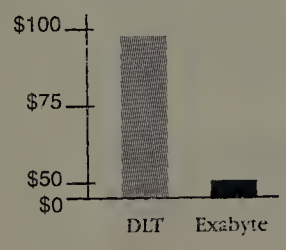

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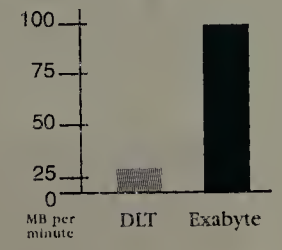

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Trendlines

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Edited by Katherine Auer

Gifts for the Technofile

STOCKING STUFFERS Ah, the annual dilemma: what to buy for that hard-to-please computer aficionado on your holiday gift list. The service-minded elves at *CIO* have spent some quality time exploring the Internet to help answer that question. Our findings are as follows:

- **Year-Round Surfing.** If your loved ones love day-by-day calendars but have grown weary of Dilbert's office antics or polysyllabic SAT words, make the new year more exciting by offering them the Daily Webpage Desk Calendar. For just $12.95, you'll be giving them a URL a day, complete with a full-color picture of each site. Holidays and historical dates feature appropriately themed pages. The sites are screened for stability (no one likes a dead link) and for suitability for family use. There's even an educational version for students! Place your order online at *www.usacitylink.com/holiday/calendar/default.html* or by phone at 800 642-2912.
- **Board Games.** Ever wonder where old circuit boards go when they die? The clever folks at Cybercalifragilistic Gifts in Hollywood, Fla., have used the colorful boards to create a number of novel desk accessories. Binders, address books, planners, calendars and even spiral-bound journals are all available with attractive circuit board covers that catch the light the way only the finest com-

A Final Farewell

COMPUTER RETIREMENT There was no minister, no coffin and no official eulogy. But when the time came to bid goodbye to MIT's CM5 supercomputer, 60 people—MIT students, faculty, scientists and guests among them—stood by to pay respects and witness the final flick of the switch that marked the end of four years of loyal service.

Acquired by MIT in 1993 from Thinking Machines Corp., the CM5 (officially a 128-processor Connection Machine Model CM5) began its illustrious career at MIT as the 17th most powerful computer in the world. At the time of its demise, it had slipped to 497th, but not before it served as the flagship of Project SCOUT, a collaborative, interdisciplinary project between programmers and users from a variety of institutions and departments. In its spare time, the CM5 dabbled in both celluloid and chess, snagging a role in the film *Jurassic Park* and beating out formidable competition in chess games, sometimes against computers a few generations more advanced.

The computer was retired to make room for new equipment at MIT's Laboratory for Computer Science, and its future remains uncertain; for now, it has been placed in storage. But the farewell celebration allowed it to go out in style, proving that old computers never truly die. They just get upgraded away. ■

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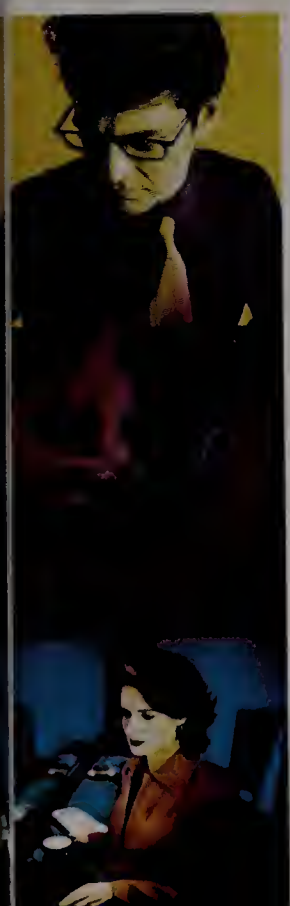

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Trendlines

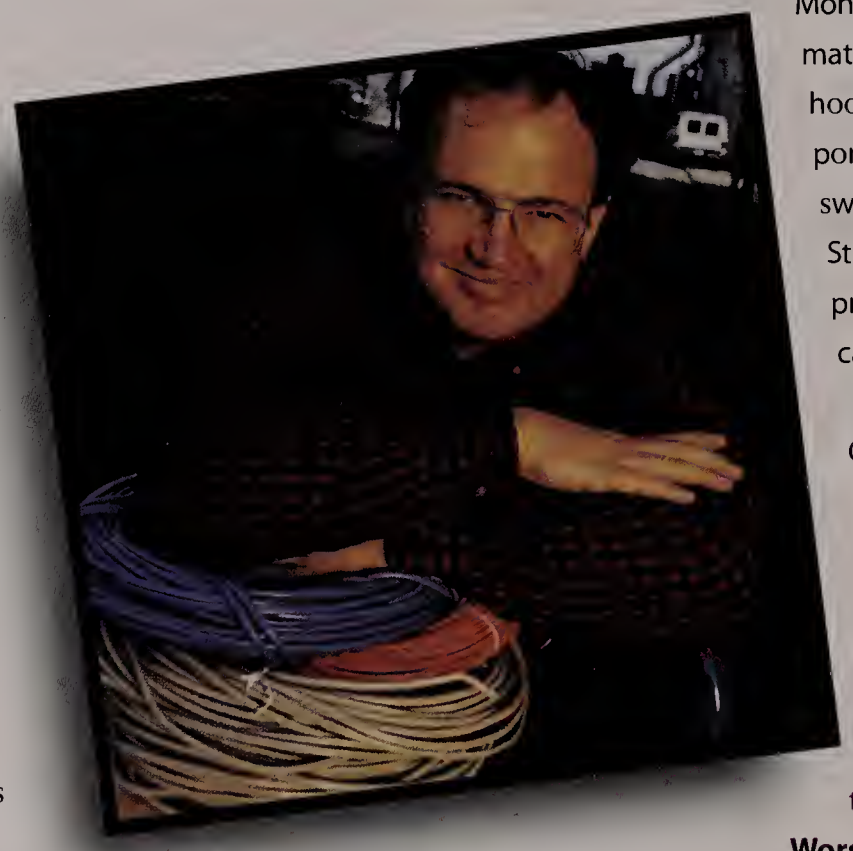
puter hardware can. More ostentatious computer geeks might be pleased to receive a flashy circuit board business card holder. And for the executive who still prefers paper to e-mail, consider the paper cube: nickel-plated pins surrounding a stack of paper cut from defunct maps and resting on—you guessed it—a hefty slice of circuit board. Corporate discounts are available for bulk orders. Visit *www.cybercal.com* or call 800 713-7701 for details.

▸ **The Light Fantastic.** For that special someone atop your A list, consider a gift of electrifying beauty that has the added cachet of having been cast in the movie *Star Trek: First Contact*. Luminglas, created by the electronic artists at Boston-based Strattman Design, is a kinetic light display sealed between two pieces of glass. Plug it in and watch the multicolored lightning bolts dance or, for a more restful objet d'art, adjust it to maintain a static pattern. The blue, coral pink, forest green, white, turquoise and traffic-light green streaks of light are produced by a computer-controlled process that traps inert gas and phosphors between the fused glass plates. Best of all, Luminglas sculptures can be customized to suit any postmodern decor. Sizes run as large as 24 by 24 inches. As for shapes, the Strattman Web site boasts, "If it can be drawn, it can be made!" No word on prices, but we're guessing they're high.

For more information about Strattman, which also offers plasma globes and neon designs, go to *www.strattman.com*. *–Sara Shay*

Words from the Wise

NETWORKING ADVICE Think you have network woes? Try building from scratch networks that must run with zero downtime for 7,500 or so users. That's what Bill McCauley, director of engineering at GeoNet Communications Inc., does for a living. His company, a corporate Internet service provider based in Redwood City, Calif., sets up networks to provide Internet connections for huge trade shows, including Comdex and Seybold. *CIO* asked this network guru to talk about his job and share tips on network management.



Bill McCauley: *"We certainly have had our share of heart-stopping moments."*

The Job: "The company does four or five trade shows per month, though I'm not involved in all of them. Setting up those networks can require anywhere from one guy for an afternoon to 30 or 40 people working for a month on something like Comdex.

"Most IS people work in climate-controlled offices. We don't. It's really a dirty job. You're working up in the ceilings. You learn to wear old clothes."

The Pressure: "It's horrendously expensive for vendors to put together booths and demos for trade shows. The cost per hour to have a booth open is staggering. Vendors don't want to be in that situation and find out that they built the whole presentation around a live Internet connection that will be down for four hours.

"We've had only a few minutes of downtime over the last year during our shows. Knock on wood."

The Tools: McCauley uses Kaspia Systems Inc.'s Kaspia Automated Network Monitoring System. The system automatically tracks the status of any device hooked to the network and spits out reports on usage and outages. He also swears by Cisco routers, Sun SparcStations and Digital Link customer premises equipment (CPE). And cable—lots of cable.

Best Network Moment: "Fall Comdex [1996]. We accomplished a huge amount of work in a small time and everything worked flawlessly. Even better, a lot of people *noticed* that the network was up. People have gotten so used to bad network trade show performance that it was a refreshing exception."

Worst Network Moment: "We certainly have had our share of heart-stopping moments: You get a call that there's a mad hacker trying to break in or that a computer virus is loose. Even worse is when you get someplace and discover you're short of the right kind of patch cord."

The Advice: "Keep it simple. I see a lot of people who inject a lot of complexity into their networks that isn't necessary. The more complex you make a network, the less reliable it's going to be. Resist the drive toward exploding 'feature-itis.'" *–Cheryl Dahle*

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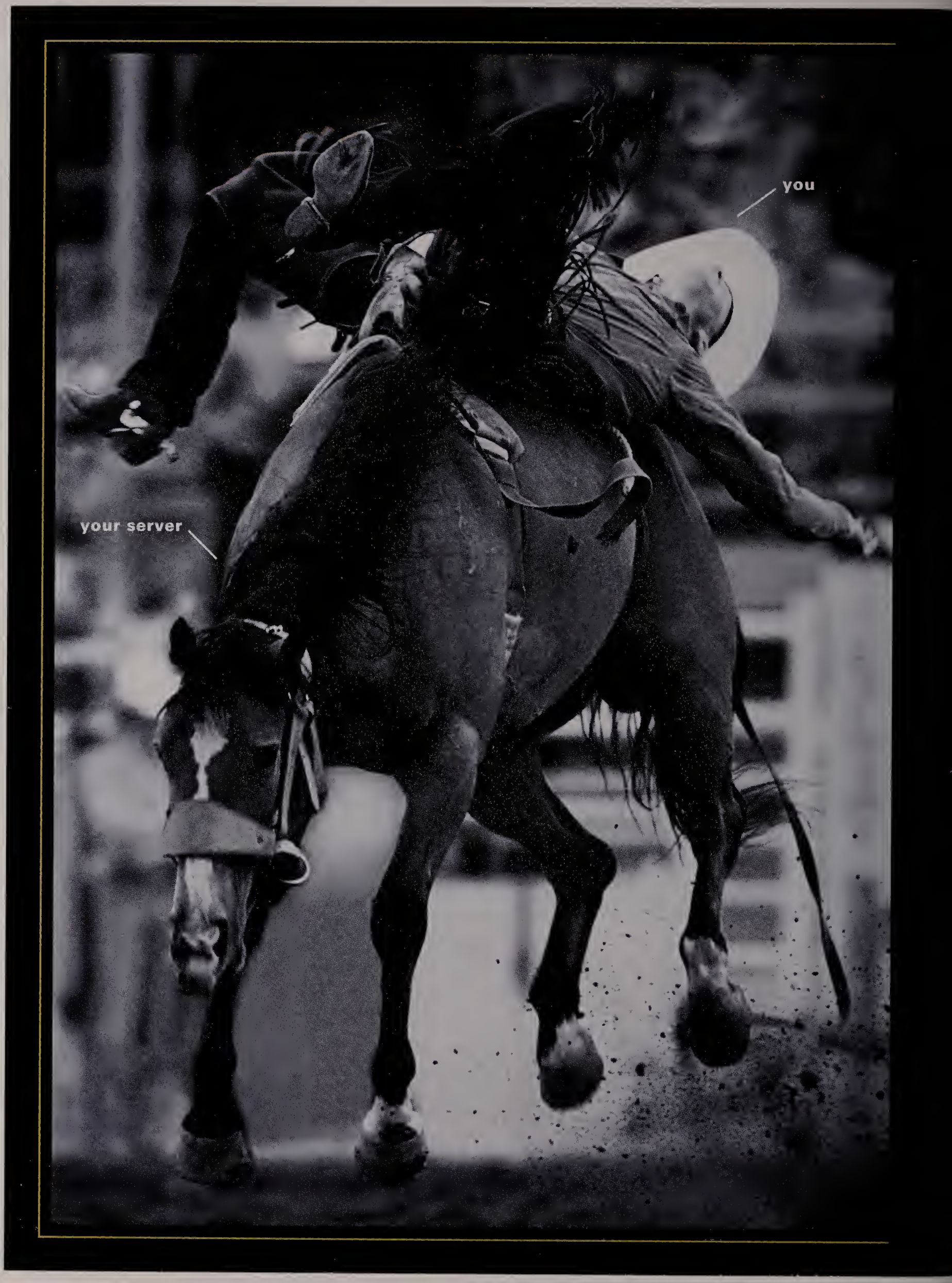
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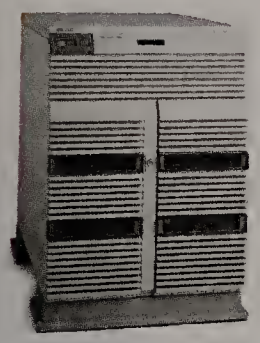

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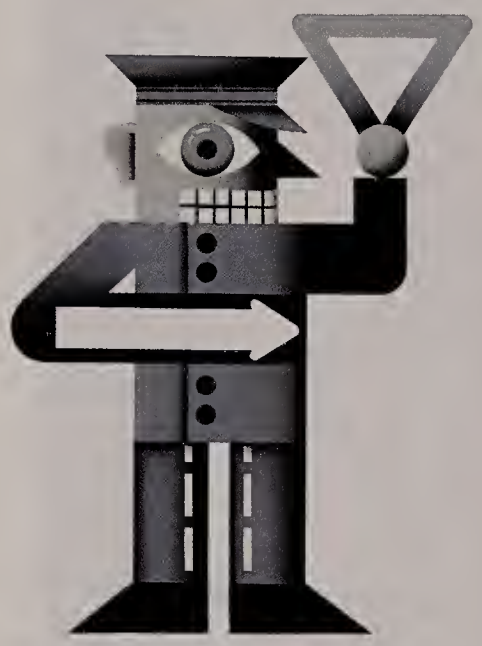
Trendlines

Net Safety

NT NETWORK SECURITY Do you have nightmares about hackers lining up at the firewalls of your Windows NT network, waiting for a chance to pillage your company's vital data? If so, there's a new automated sentinel you may want to check out. Kane Security Monitor, by New York-based Intrusion Detection Inc., is like a 24-hour security guard, constantly monitoring NT networks for suspicious activity, such as password cracking or attempts to access sensitive files. Like an experienced Pinkerton guard,



the software automatically notifies security personnel of possible intruders via e-mail, fax, pager or audible alarm.

The software can be configured to watch for specific suspicious occurrences, such as repeated password failures for a particular ID or an attempt to access restricted information. The product uses artificial intelligence to analyze security and audit data. It also identifies usage patterns for every individual with network access and creates digital signatures for each user. So if a user who customarily logs onto the network during normal business hours requests

ILLUSTRATION BY LISA MANNING / LAUGHING STOCK; PHOTO BY VITO ALUIA

FLASHBACK

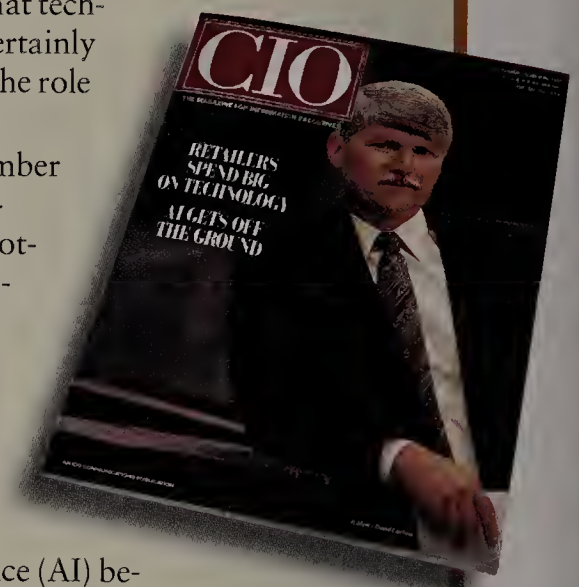
10 Years Ago In *CIO*

December 1987

On the cover: David Carlson, vice president for corporate IS at Kmart

Carlson today: Senior vice president and chief technology officer at Ingram Micro Inc., a Santa Ana, Calif.-based wholesale distributor of technology products and services

What's changed: "With Kmart management 10 years ago, it would have been very difficult to convince all the executives that technology could dramatically change the nature of retail," Carlson says. "There were officers at Kmart who bragged about never having visited an ATM. Really, they were technophobic. Today it's hard to find any member of management who would resist the notion that technology affects their business every day, and I certainly think it's easier to convince management that the role of technology must be acknowledged."



What hasn't changed: In the November/December 1987 *CIO* cover story, Carlson stated that customer service was the same as the company's bottom line. Enhance that service through technology, and you enhance the bottom line. He still feels strongly that customer service is *the* target for technology; if you achieve that, the bottom line will follow.

Expert Systems 1987-97

The expert system—and the artificial intelligence (AI) behind it—was one of the Rodney Dangerfields of 1987. Today there's grudging respect for these systems, but you won't find them topping most strategic planning priority lists. Even DuPont Co., which was churning out hundreds of expert systems 10 years ago and has implemented some 1,200 to date, has cooled off a bit.

Former DuPont AI chief Ed Mahler, interviewed in 1987 for the *CIO* article, "Expert Systems Pan Out at DuPont" (see *www.cio.com/anniversary*), predicted there would be 2,000 expert systems at his company by 1990 and boasted of a 1,500 percent average annual ROI. Mahler's prediction probably would have come true if not for DuPont's subsequent cost cutting and restructuring program, which by 1996 had reduced IT costs by 45 percent, or $540 million. Mahler parachuted out of DuPont in 1992 and took to consulting full time with his Wilmington, Del., firm, E.G. Mahler and Associates Inc. He's still gung-ho on the value of expert systems, however. "Their value has remained constant over the past 10 years, and it's the ability to capture different knowledge and deliver that knowledge to the point of decision making."

Mahler's AI successor, Aaron Clevenson, says expert systems are alive and doing OK at DuPont, but the pace of development has clearly slowed. The company still follows Mahler's philosophy that smaller is better: The crash and burn of a few smaller systems poses much less risk for the corporation than the loss of a mega system. The expert systems are friendlier today and more subtle; many are embedded in larger applications, says Clevenson, who recently transferred to DuPont's outsourcer, Andersen Consulting.

Unfortunately, because of corporate restructuring, users, who are responsible for developing their own expert systems, are too time-pressed to devote the necessary attention to training and development. Says Clevenson, "it's a hard sell because people are stretched too thin. We're not seeing the level of development we would expect for something that gives a power-of-10 ROI."

–Richard Pastore

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Trendlines

access in the middle of the night, for example, the software would notify a security officer or network administrator.

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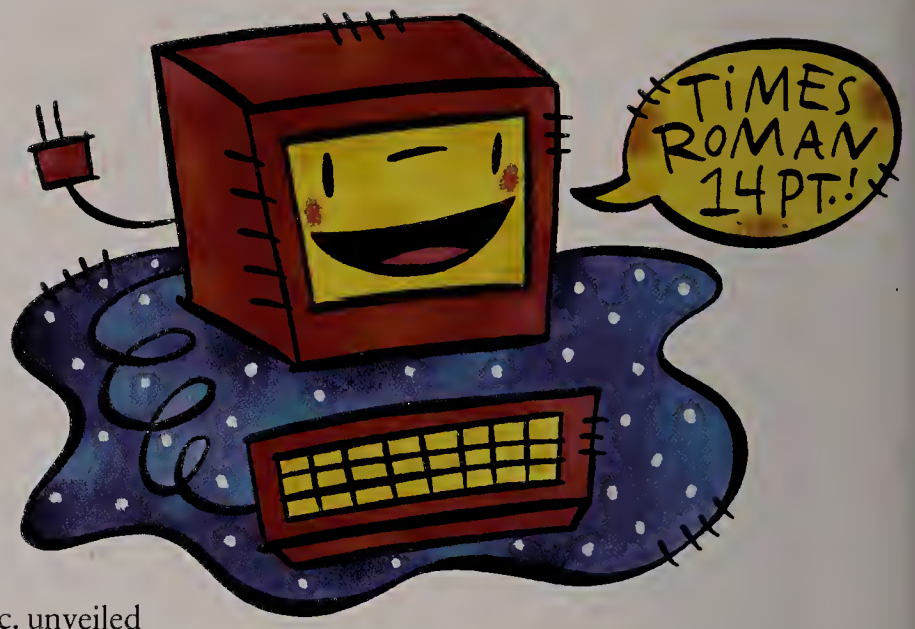

JAVA API Java is already known as the language that can operate on any computer platform. Now it can be used to build applications for just about any person, including the blind. Sun Microsystems Inc. unveiled the Java Accessibility API this summer, and several companies are preparing to take advantage of some unique Java attributes to improve computer interfaces for the visually impaired, the dyslexic and people with other disabilities.

Java allows developers to provide visually impaired people with detailed information about what's on a computer screen via assistive technologies such as screen readers, speech-recognition systems and Braille terminals, says Rich Schwerdtfeger, lead architect in IBM Corp.'s special needs systems division in Austin, Texas. For example, when working in a word processing application, blind users need to hear which fonts, type sizes, margins and the like appear on their screens. Using assistive technologies, Java lets developers present more of that information than other platforms do. "Blind people are going to have better access to computer applications than they've ever had before," Schwerdtfeger says.

In addition, the protocol "was designed to allow people with disabilities greater access to the world of Web technology—both at home and in the workplace," says Jon Kannegaard, vice president of software products at JavaSoft, a Sun division in Palo Alto, Calif. Future versions of Netscape Navigator will have the Java Accessibility API built into them, opening a new window into the Web for the blind.

Finally, IBM is tailoring assistive technology based on the API for dyslexics: It is planning to develop an application that improves reading comprehension by highlighting words while a computer reads them aloud. ■

ILLUSTRATION BY MARY ANNE LLOYD

The Right Stuff

I.T. EDUCATION Are you in need of a primer course on virtual reality? Or perhaps seeking a comprehensive education in multimedia? Maybe you're looking for a way to bring your staff up to speed on some critical new technology. Whichever the case, the University of Advancing Computer Technology (UACT) can probably help.

The UACT offers a variety of degree programs and industry training services in a wide range of technology areas. Formerly known as the CAD Institute, the UACT offers bachelor degree programs and continuing education courses in such areas as virtual reality, the Internet, multimedia, CAD, animation and software engineering.

Programs are designed in cooperation with the Phoenix-based university's advisory board, comprising both local and national technology companies. Students who attend the UACT full time can receive their degrees in less than three years.

Most courses in the UACT's programs focus on technology, but even those that aren't strictly technical share a similar orientation, says Marni Pingree, marketing specialist at the university. For example, "An English class may deal more with technical writing than creative writing." In addition to lectures, students gain intensive hands-on experience at individual networked workstations.

Founded in 1983, the school also operates the Computer Reality Center, a 3-D computer graphics facility that provides training and produces 3-D graphics, digital animation, Internet content, interactive multimedia and virtual reality projects for industry, the military and government agencies. Its clients include the City of Scottsdale, the Arizona Diamondbacks baseball team and the Egyptian Ministry of Education.

The UACT is currently building a new campus in Tempe and has developed a virtual reality tour of the site. To experience it for yourself, visit *www.uact.edu.* ■

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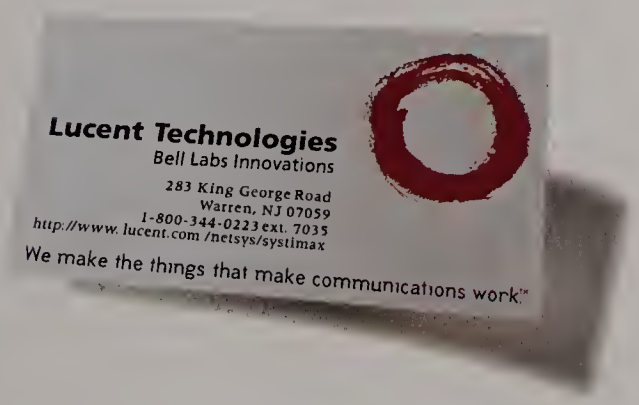

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Not-So-Secret Agenda

Bag the tech talk. Successful meetings require planning, practice and plain English.

BY ERIC TORBENSON

YOUR BUDGET MEETING presentation has reached its apex, but no one's listening. The CFO is replaying all the strokes from his weekend golf round in his head. The budget director's got a look on her face like you're reading from the phone book. And the senior vice presidents are making origami out of your handouts.

The vital meeting gone amok. Weighed down by complex tech talk, the IS strategy can slip off the corporate agenda despite the CIO's efforts.

Making sure the technology message comes across in meetings with tech-wary audiences ranks among the toughest challenges facing CIOs. Pulling off an effective meeting of any type isn't easy, but selling the business team on the innards of the latest client/server software seems at times akin to teaching kindergartners Sanskrit.

Consultants and IT executives use different tricks to turn cross-functional pressure cookers into feel-good gatherings. But the overall message is exceedingly clear: Winning the business suits over to the pocket-protector perspective starts long before the doughnuts are passed around.

The tenets of crafting effective meetings come from practices that serve CIOs well every day: Combine ungodly amounts of preparation with a precision-engineered message to an audience that has been pre-sold on the idea. Do it without jargon, but do throw in spoonfuls of self-deprecating humor to humanize IS—two capital letters that still carry scary connotations for many.

In preparation for a big budget review meeting, Senior Vice President and CIO Deborah Gillotti spent a significant amount of one-on-one time with MIS team members before making her presentation to the executive steering committee at Starbucks Coffee Co. in Seattle. She aimed to create "champions" for a slate of capital-heavy network and telecommunications infrastructure initiatives designed to prepare the fast-growing franchisee for espresso-paced expansion. Members of Gillotti's team consulted their business-side counterparts as well.

CORNER IMAGE BY CARL TREMBLAY; ILLUSTRATION BY HAI MAYFORTH

Teaching CIOs to understand the business audience at meetings occupies most of Debra Schmitt's consulting time. As a vice president and head of the organizational effectiveness practice at Symmetrix Inc., a management consultancy in Lexington, Mass., she helps CIOs analyze the technical savvy of fellow executives. Casting business executives as results-oriented "drivers" or as "analyzers" wanting stacks of historical numbers to back decisions helps CIOs target presentations. Some executives crave attention and can't give a thumbs-up without knowing they'll get a piece of the praise; that shapes how a CIO should present an initiative, Schmitt says.

At Starbucks, Gillotti designed her two-hour meeting by assigning different parts of the presentation to team members. Using a stopwatch, they honed their speeches to no more than three minutes. By taking about eight catch phrases from the business team's own strategy and working them into the presentation, Gillotti sought to show the committee how her department was an integral part of business goals.

Each member of Gillotti's team presented a section of the IS infrastructure and demonstrated how each part could be seen as building material for a home. As the members laid out the different aspects of the network for the committee, a house took shape on the overhead projection. Making the leap from technical issues to a familiar object was the breakthrough for many, Gillotti said.

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Executive Counsel

So much of what technology executives do in these meetings boils down to glorified translation, says Karen Antion, former IS director and CIO and now chief technology officer for The Port Authority of New York and New Jersey. CIOs must make the material clear to the executive who thinks SAP runs from trees. "A lot of these people don't have the technical understanding of these things, nor do they need to," Antion says. "My job is to translate these technical details into business implications."

Take Antion's challenge with the enterprise systems at The Port Authority. For years, the best system available for accounting, payroll, human resources and other tasks was purchased and implemented on a sort of à la carte strategy. Under a new technology master plan, Antion wanted to replace all the enterprise systems with an integrated suite of SAP software for the company's financial systems, linked to PeopleSoft software for its human resources and payroll needs. The costly move would create some logistical headaches.

Antion compared the plan to how people bought software for their personal computers years ago versus today. When the first PCs came out, owners purchased word processing, graphics, e-mail and other software from a host of vendors. Today, she told the committee, when people buy a computer, they typically have a suite like Microsoft Office preinstalled. The advantages are clear: A suite is easy to use, entails no installation hassle and involves substantially less cost than trying to buy all the functions of the suite through other software. "I tried to personalize [the plan] for them," she said. "Not only did it create an experience any person could relate to, but it reduced the anxiety level significantly." The Port Authority recently completed much of the changeover.

Even the most creative message can fizzle at an ill-planned meeting, however. Beverly Lieberman, president of IS executive search firm Halbrecht Lieberman Associates Inc. in Stamford, Conn., suggests keeping the business team intrigued at meetings. "Partially because IT people are more likely to be introverts, it becomes more difficult to be spontaneous and intuitive and overtly engaging," she says.

The trouble with tech-laden materials is that they often require extemporaneous delivery to prevent the glazing of nontechnical eyes. Follow some basic meeting rules, Lieberman advises: Stick with English, keep a "30,000 foot overview" of the sticky details, and present short, tidy explanations. In fact, for meetings attended by the business team underlings as well as head honchos, Lieberman advises CIOs to ask the senior executives to depart after the overview, leaving the lieutenants to chat over the nuts and bolts.

Gillotti and others favor finely structured meetings with agendas, goals and a written purpose. Most meeting gurus point toward Intel Corp., which has formalized rules about how meetings take place. "It's really surprising how many meetings don't have an agenda or a clear purpose," says Schmitt of Symmetrix.

Gillotti spent a day-and-a-half for planning and reviewing the presentation with her team, a process she'll likely repeat for the same meeting this year. But the rewards of thoughtful planning were clear. Gillotti received funding for nearly everything she had requested and ample praise: "One of the senior VPs who had recently come from another company told me that it was one of the best meetings he'd ever been to, " she says.

Sometimes corporate structure will necessitate cooperation between technical and business teams at meetings. For Tom Espeland, senior vice president and CIO of Viacom Inc.'s Showtime and MTV networks in New York City, most technical projects are co-managed by a member of his team and someone from the business side. Without understanding between the two sides, projects can't move forward. Espeland himself co-managed a project to bring more financial functions to the networks' outside sales force, an undertaking that helped him build trust with the business team.

While what a CIO says and does at cross-functional meetings is important, Espeland also sees an opportunity to listen to the business team members and gauge their reactions to upcoming change. "There are a lot of emotions at stake when solving a problem if all of these business team leaders haven't bought into the solution," he said. "You have to be sensitive to that potential loss of control from their perspective."

Presentation Tips

Pleased To Meeting You

- **Resist charts.** Don't run to the comfort of a whiteboard and diagram databases. "I've been at a lot of bad meetings that go that way," laments Tom Espeland, senior vice president and CIO of Showtime and MTV networks in New York City.
- **Organize quick presentations.** Use a five-point plan, says Debra Schmitt, vice president and head of the organizational effectiveness practice for Symmetrix Inc. in Lexington, Mass. Make the last point the most important.
- **Wake them up.** Schedule meetings in the morning to catch people when they're most alert.
- **Create handouts with common goals.** Include business team strategy statements to drive home the message that the company can't do what it needs to do without IS.
- **Have fun.** "It helps to have presenters poke some fun at themselves," says Deborah Gillotti, senior vice president and CIO of Starbucks Coffee Co. in Seattle. "You make yourself that much more human."

Although perfecting the pitch in cross-functional meetings presents the toughest challenge for a CIO, Schmitt advises that the technology expert make sure the device isn't going to overpower the message or knowledge it's designed to deliver. "I remember one meeting where a gentleman was trying to use a banana as his example. He tried to show that if you put a wrapper on a banana and take it through different databases, the wrapper would come on and off and different things would happen to the banana. After surveying the group, I found they didn't really remember much about how the databases worked. But they did recall the banana." CIO

Eric Torbenson is a freelance business writer based in St. Petersburg, Fla. He can be reached at etorb@packet.net.

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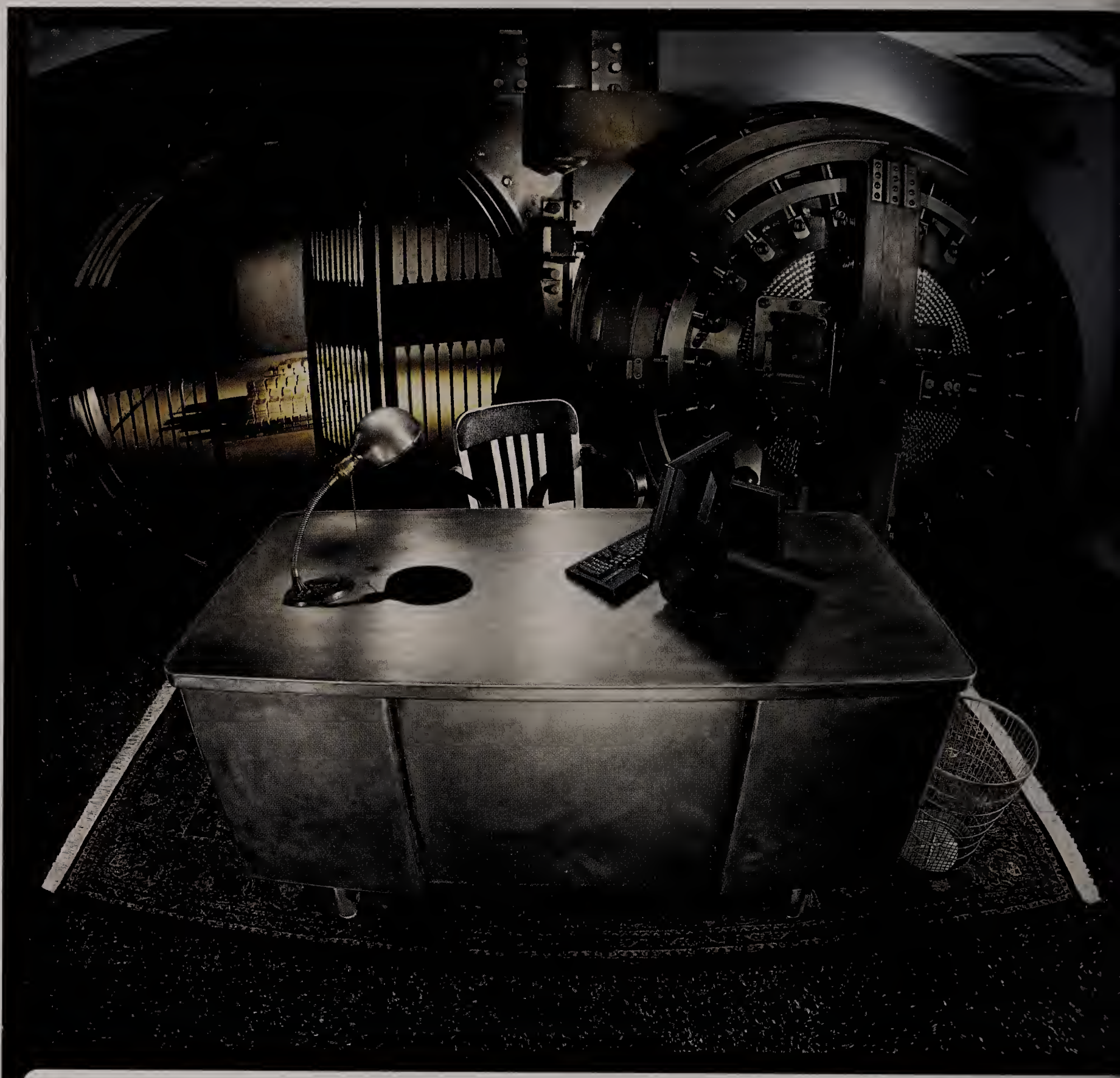

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EYE On

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CIOs, bent on wringing operational efficiencies from their IT investments, may have become oblivious to the side effects of their success

The highly accomplished CIO plying his or her trade for an HMO may well be the health-care crook's best friend. After all, the more efficient an insurer's automated billing system, the easier it is to bilk—a fact not lost on thousands of defrauders, who annually swindle private and government payers across the United States along the lines of $100 billion.

Reader ROI

THE PROBLEM OF FRAUD IN HEALTH CARE is just one example of how an IT solution to a business problem sometimes aggravates—or even creates—another problem. In this interview, readers will deepen their understanding of

- The nature of IT-enabled fraud
- CIOs' responsibilities in countering fraud
- The indispensability of human involvement in automated processes

It's not that IT executives have been willfully complicit. They've just been susceptible to a malady that infects the profession in many industries: tunnel vision. Fraud, for instance, is easy to commit when automatic claims processing works perfectly. Thus, a singular focus on efficiency in paying bills has brought both tremendous gains and horrendous losses.

In 1993, the matter was brought to the attention of Malcolm K. Sparrow, a lecturer in public policy at Harvard's John F. Kennedy School of Government in Cambridge, Mass., by none other than the attorney general of the United States, Janet Reno. Sparrow had been working with the IRS on ways to sort through fraud problems in its electronic refund system, and Reno had just named health-care fraud the number-two priority in the Department of Justice, after violent crime. "We need all the help we can get to understand the problem," Reno told Sparrow. "We'd be delighted if you'd take a look at it from an outsider's perspective." (Sparrow is a British national living in the United States.)

Sparrow's research into the problem led to a book, *License to Steal: Why Fraud Plagues America's Health Care System* (Westview Press, 1996), that details how countless claims are paid to people who bill for services never rendered, products never

PHOTOGRAPHY BY WEBB CHAPPELL

delivered, diagnoses wildly exaggerated and activities that have nothing to do with medical care—such as marketing and partying.

The study also revealed a curious lack of interest in the problem, even among the victims. Actually, the collective yawn is understandable in health care, given the transformation of the market over the past five years. Hillary Rodham Clinton's plan to reform health care may have gone belly-up, but it got far enough to scare the industry into "reforming" itself. New entities, formed by hundreds of mergers and consolidations among hospitals and other providers, have had to make massive cuts just to stay alive. Administrative tasks, such as billing, have been one of the lowest-hanging fruits; automation has enabled efficiencies undreamed of a few years ago. Payers have often been ahead of providers in applying IT solutions—and just as prone to blind spots. With so much process to lop off, why bother worrying about a fringe problem like fraud?

"There's a cultural split between people who can't tolerate sticky exceptions and the investigators who think they're pursuing justice."

A mathematician by training and holding a doctorate in applied mathematics, Sparrow served 10 years with England's Kent County Constabulary, where he commanded at different times a tactical firearms unit, an underwater search-and-recovery unit and a "fraud squad," and rose to the rank of detective chief inspector. The law enforcement pro in him is outraged at the thought of all those criminals getting away with all that crime. "Even though I'm not an American," he says, "it makes my blood boil."

Although Sparrow's conversation with *CIO* Senior Writer David Pearson centered on the situation in the health-care industry, the observations he made have implications for all businesses focused on pressing procedural efficiencies from their IT investments.

CIO: *How has computerized automation in billing created a dream scenario for thieves?*
Sparrow: Imagine that you want to steal as much as you can, as fast as you can. Just blast a wide variety of insurance claims for payment.

Some will get rejected, others will come back reduced and still others will be paid in full without so much as a hiccup. If you know you're dealing with a fairly mechanized payment system, you know that if it behaves a certain way today, it will behave exactly the same way next week. Once you find a hole—a type of claim that gets automatically paid without any human intervention—you can submit hundreds or thousands of similar claims without any fear of detection.

CIO: *What's the solution?*
Sparrow: Someone at the payer organization needs to deliberately build in some unpredictability and variation. Some risk of a purely random audit should make up the centerpiece fraud control.

CIO: *Does that provide software vendors with an opportunity to develop new antifraud products?*
Sparrow: There's enormous potential for more sophisticated pattern-recognition systems—those that could spot unnatural coordination between disparate accounts and emerging billing anomalies before they get to be systemic. But most technology vendors that have been selling health-care fraud-detection systems have been, to date, quite narrow in their view as to what kinds of analyses and technologies are useful. They've focused mostly on postpayment provider profiling, and postpayment is far too late for many types of fraud because it assumes the provider is still around to answer questions or return overpayments.

Technology could provide quick-and-dirty prepayment provider profiling so that we could see if a provider's billing pattern is significantly different this week from what it was last week. But technology alone isn't enough.

CIO: *Does that mean you're really against a technological solution in this case?*
Sparrow: I've been accused of being antitechnology with this message. The fact is, I'm not antitechnology at all; I'm very much a technologist at heart. I'm merely pointing out that the health-care industry, for one, has embraced the claims-processing efficiencies that technology offers but hasn't paid enough attention to the new threats that come with a high level of automation. That doesn't mean the answer is to switch back to paper-based processing—that's inconceivable, and I would never suggest it for a minute. What we need to do is understand the relationship between humans and technology and how they should work together to produce effective fraud control.

CIO: *What would the ideal prevention and enforcement system look like?*
Sparrow: I'd like to see companies use a persistent, random risk of review, complete with external checking. No one should be able to count on thousands of claims going through without

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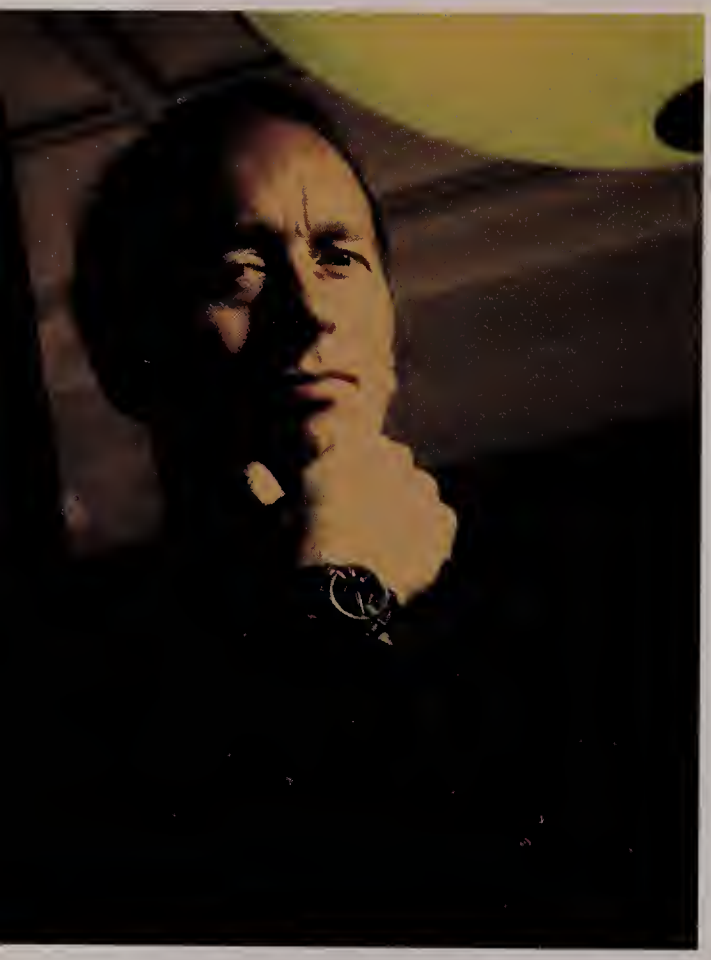
scrutiny. If you use a random review, even an elementary review of a very small percentage of claims, many of the "repeat firing" schemes would be uncovered; and by doing those reviews before issuing payment, companies would find a pattern in those bogus claims in time to be able to hold up payments on the whole scheme.

The persistent threat of audit in America's tax system reduces fraud because you never know when an IRS auditor is going to call. The odds are slim, but you know it could happen. In health care at the moment, fraud perpetrators are quite sure it's not going to happen. And many are well set up to vanish the moment a human does appear on the scene. Then they just set up shop in a different place, under a different name.

"CIOs have **failed** to appreciate the complexity of **fraud** control in a highly automated environment."



CIO: *How receptive have CIOs been to your message?*
Sparrow: Most of the CIOs I've met are naive about the vulnerability of their systems. They—and the whole data processing operation, for that matter—seem totally devoted to processing efficiency and the application of technology toward that end.

There's a cultural split between the people who are efficiency-oriented—who can't tolerate sticky exceptions—and the investigators and analysts who think they're pursuing justice and are very diligent about handling the exceptions rather than the bulk. These two cultures constantly run up against each other, even though you would expect that a common concern for the bottom line would unite them.

CIO: *You're suggesting that CIOs have invested so much in improving processing efficiencies that they aren't prepared to pull back and "rehumanize"?*
Sparrow: Certainly, most don't want to hear about exceptions handling and holding up payments, or anything else that might threaten to knock a hole in their achievements.

CIO: *Are CIOs well positioned to champion fraud control in their organizations?*
Sparrow: They are, but I'm not optimistic that they will. I've yet to meet a single CIO who was willing to do that since all their incentives point them in the opposite direction, toward efficiencies that are more tangible and easier to measure.

CIO: *Have they been wrong to focus on efficiency?*
Sparrow: No, but they have failed to appreciate the complexity of fraud control in a highly automated environment. There are suddenly new threats to reckon with. But even if it's not their fault, it is now a pressing obligation on CIOs to get their minds around the problem and find out where their systems are vulnerable, how they're vulnerable and what to do with technology to help fix the problem.

CIO: *So how do you hope to shake the world out of its complacency?*
Sparrow: This is a very unpopular message. No one wants to see their company named in the same sentence as the word "fraud." They want to reassure taxpayers or stockholders, so they aren't willing to march out in the public spotlight and say, "We are undertaking a concerted attack against fraud in our system" because it sounds too much like a confession of past failure.

I implore insurers and payers to institute systematic measurement programs. We'll never be able to make appropriate resource allocations in fraud control until we are willing to measure the losses. Otherwise, any investment in fraud control looks like a concrete expenditure with an uncertain payoff.

CIO: *Are CIOs in other industries as vulnerable as their health-care counterparts?*
Sparrow: Almost everything I've said about processing medical claims could be applied to processing payments in any industry. There are many other major government programs—student loans, FEMA, welfare programs, food stamps—that we know have very significant fraud problems. CIOs in every industry have to make a judgment between the competing priorities of processing efficiency and appropriate safeguards. Their challenge is not choosing between the two but integrating them in a high-volume, automated environment. That's the current challenge, and it's much broader than health care. CIO

Senior Writer David Pearson can be reached at dpearson@cio.com.

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Crossing No Man's Land

Successfully smuggling information across the no man's land between enterprise software packages can have more bottom-line impact than the applications themselves

BY CHRISTOPHER KOCH

When Tom Burn spots an anomaly in the Canadian city of Edmonton's payroll report, he wants to know more—say, how someone manages to work 140 hours in a single week. That's a natural query to ask of a city's computer system, especially one that boasts some of the best so-called enterprise resource planning (ERP) software on the planet: SAP R/3 (from SAP AG) for financials and PeopleSoft (from PeopleSoft Inc.) for human resources. These programs can slice and dice data better than an infomercial chef with a Ginsu knife. When peculiarities appear, Burn, Edmonton's director of business process integration, should be able to backtrack through the payroll report to find who added an extra digit to the offending time sheet.

PHOTO BY CHRIS SCHWARZ

Tom Burn doesn't like being out in the cold wasteland where his enterprise applications won't talk to each other.

Reader ROI

NO SINGLE ERP PACKAGE CAN HANDLE all a company's needs. But installing multiple packages from different vendors to achieve full coverage comes with its own set of pitfalls. In this story, you will discover

- How to select multiple ERP packages
- Ways to make sure those packages work together harmoniously
- Ways to influence the vendors to build the functionality you need

Unfortunately, he can't. When the payroll information ships from PeopleSoft to the SAP financial system every two weeks, it loses any context or connection back to the time sheets in the HR system. "Your ability to drill down into the information ends when it goes [between the two systems]," says Burn. "We have to stop at the SAP border. Any information we want from the human resources system we have to go and get manually."

This is the dirty little secret of ERP software. These packages work wonders as long as the "enterprise" falls under the domain of a single vendor's package. But when information needs to cross the border between rival packages, stand back. It's every byte for itself.

It wasn't supposed to be that way. But the plating on the ERP "silver bullet" has worn off, revealing the same complex, inflexible computer code that CIOs have struggled with for decades. Out of the settling flakes some painful truths have emerged: No company can meet all its needs with one ERP package, no ERP vendor is interested in making its package work with a direct competitor's package, and any CIO who believed consultants who said, "Don't worry about the integration" during the Bush administration has had at least one new job since then.

The plating on the ERP "silver bullet" has worn off, revealing the same complex, inflexible computer code that CIOs have struggled with for decades.

So what's a CIO to do? You may already have an enterprise package, or you may be under pressure to implement one, even with its drawbacks. The software isn't going away, and in some ways the situation is improving. In other ways, CIOs still face an integration nightmare. We talked to CIOs who are

Head Them Off at the Impasse

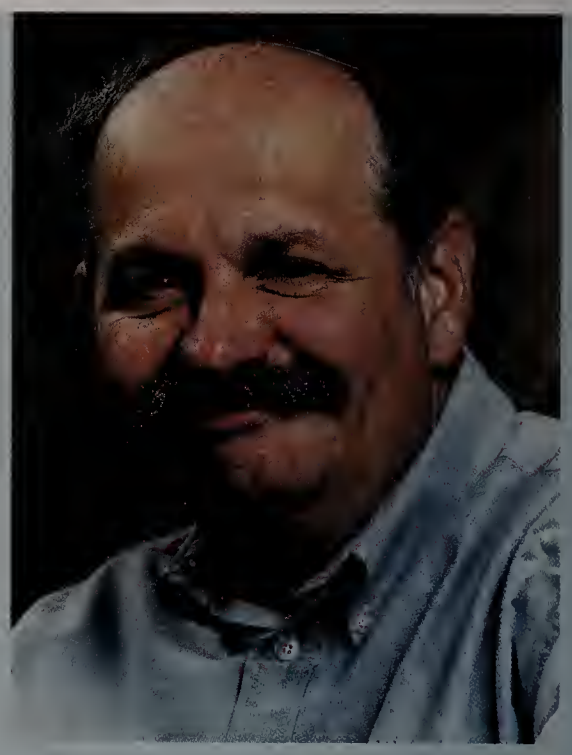
How one CIO learned that sometimes you have to take matters into your own hands

For some CIOs, ERP software looks like a superhighway with too few on-ramps. ERP often bypasses CIOs' most critical business processes—usually because those processes are unique and cannot be translated easily into software terms. Some companies' core information is gridlocked in legacy systems or in add-on software that has no direct link to ERP.

Peter Burrows, vice president of MIS and chief technology officer for Reebok International Ltd. in Stoughton, Mass., knows the frustrations of watching ERP pass by. He tried for years to no avail to get SAP AG to build a ramp from its client/server ERP product, SAP R/3, to the apparel industry's core processes. Many companies in other industries have gone ahead and bought the stuff anyway in hopes that the ERP vendors will someday address their industry's specific needs. But Burrows could not afford to take that risk.

He is not alone. ERP software is so expensive to install and customize that CIOs are trying to find other ways to get the peculiar functionality they require. The most successful tactic so far has been to band together with other CIOs in industry consortia to gain more leverage over vendors. Fortunately for CIOs like Burrows, ERP vendors are beginning to see opportunity in vertical industries, such as apparel. "That's the next frontier for ERP," predicts Vinnie Mirchandani, research director at Gartner Group Inc. in Stamford, Conn. "The consortia are great sources of ideas and provide a way to get solid commitments from customers."

Relations were not always this collegial among CIOs and ERP vendors. When Burrows first began considering R/3 in 1993, he loved its concept but hated its scope. For three years, SAP and Reebok remained stuck at a friendly

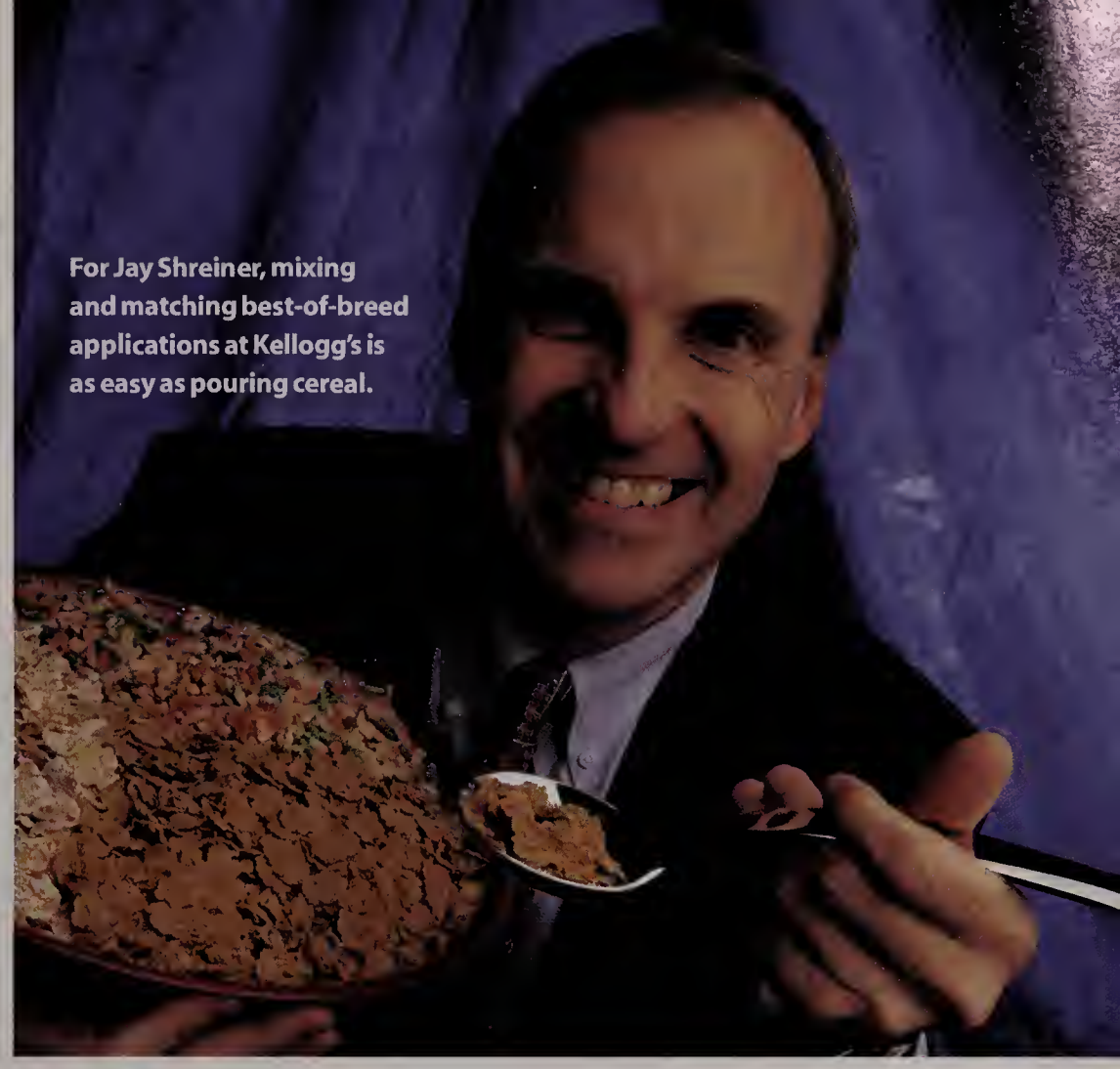


Reebok's Peter Burrows has found that to make ERP work, you have to put on your work clothes and dig in.

impasse—both wanted to do business, but neither side was willing to take the risks necessary to come up with a solution. "I could have pounded on the table all day, but they weren't going to commit to making R/3 meet my needs unless I reduced their risk," says Burrows.

So in 1995 he offered to don a hard hat and take on some of the work himself. That year he opened discussions that resulted early the next year in a joint software development consortium with SAP and another apparel company,

in the thick of dealing with ERP to see how they're faring, one way or the other, and they revealed some of their tools for optimizing their systems. In the companion piece to this story on Page 46, "Head Them Off at the Impasse," we look at some dissatisfied CIOs who've taken matters into their own hands when it comes to working with vendors.



For Jay Shreiner, mixing and matching best-of-breed applications at Kellogg's is as easy as pouring cereal.

Right Choice, Wrong Time

Tom Burn was fortunate. At least he knew what he was getting into when the city of Edmonton chose both SAP and PeopleSoft in 1994 to manage its financial and human resources departments. The incompatibilities were worth the trouble because the city's more than 25-year-old mainframe system was on the verge of collapse. And even with the uneasy relations between the two software packages, the Wyomissing, Pa.-based VF Corp., which makes bras and Wrangler jeans, among other things. The deal was a simple exchange of knowledge: apparel industry process secrets in return for R/3 development expertise and coding. There was something in that exchange for everyone. Reebok and VF got the software customization they needed at a fixed price from SAP, while SAP got a deal maker for grabbing new customers in apparel—software designed and tested by some of the most competent players in the footwear and apparel industry.

To keep participants on their toes, the consortium brought in Kurt Salmon Associates Inc. of Atlanta, a management consulting firm that specializes in retail, to bring an impartial viewpoint to the negotiations. "Each side has its own interests," says Jeff Singer, apparel and footwear manager for SAP America Inc. in Lester, Pa. "I want to leverage this across a broader customer base, and [Reebok and VF] just want to get this installed quickly."

The process seems to have worked. The contract that created the consortium was signed in February 1996, and the software is going to beta testing at Reebok and VF before the end of this year, says Burrows. Meanwhile, Singer says he has a solution that will sell across the industry. "Companies get excited when they see this product because they can see their businesses in it," he says. Based on the pre-release version of SAP R/3 AFS (which stands for apparel footware solution), five new members have joined the consortium and will join in implementing and furthering the development of the software, according to Singer.

The major ERP vendors are notorious for letting their ambitions run too far ahead of their resources.

Caution: Roadblocks Ahead

On the surface, industry consortia seem like a great solution to the ERP functionality gap. But look ahead and some potential pitfalls begin to appear. How much can an ERP vendor afford to spend on these labor-intensive efforts before its service and support begin to suffer? "The problem [for ERP vendors] is that once they commit to a vertical industry, their customers are not going to stop asking for more," says Vinnie Mirchandani, a research director with Gartner Group Inc.'s technology applications group in Stamford, Conn. "They will want their continuous pound of flesh."

The major ERP vendors are notorious for letting their ambitions run too far ahead of their resources. Customers have paid the price in poor service and slow implementation. For CIOs investing in these group software projects, the price could be even higher: Software snafus and delays could threaten their most important business processes.

Even if the product ships on schedule, it will inevitably be watered down to meet the needs of everyone in the industry. Or worse, the solution will be defined by the companies that have the most resources to throw at the development process. Companies that show up late or cannot afford to participate are at a disadvantage.

Meanwhile, Burrows is taking no chances. "I figure I'll have a year before Nike gets a hold of it," he says. "By then I'm hoping I'll have added something new to my system to stay ahead." *–C. Koch*

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Transactions in the Age of the Consumer

Nabisco's Rick Blasgen finds his supply chain software is really worth its salt.

city is still far ahead of where it was in the mainframe days. But the rudimentary integration still gets Burn a little steamed. He would like to upgrade the system but can't because the cost of maintaining the link between the two products is too high to leave extra money in the coffers. On the other hand, the cost of junking either package makes that prospect unthinkable.

Other ERP customers, particularly those at sprawling Fortune 500 companies, are in similar situations. They bought into ERP applications in the early 1990s without fully comprehending the difficulties of integrating them with other packages and with legacy systems. Years and millions of dollars later, many companies are still struggling to install the software. Others have dropped it altogether.

Even today, Gartner Group Inc. estimates that IT departments typically spend 35 to 40 percent of their programming time reconciling duplicate data between different software systems and databases around their companies. Thanks to ERP integration horror stories in the media, ERP vendors are taking steps to make their applications more open and are partnering with other vendors to build bridges between their products. But these pledges have lacked ambition at best and been downright deceptive at worst.

Even when an integration goes smoothly, many experts question whether the benefits of ERP justify the costs of implementation. ERP software is dumb, they say. It cannot think about the order management process; it can only execute the commands. ERP is sort of a software middle manager that passes around the raw data of the business to those who need to see it and helps them interpret the data so it becomes useful. Yet when you put two of these software middle managers together in the same office, things can get pretty dysfunctional. They won't talk to each other unless you force them to, and even then they share only the raw numbers and none of their insights or interpretations.

A Never-Ending Nightmare

The ERP market has seen explosive growth since 1994, but that growth has been mostly in the size and scope of the various ERP packages rather than in the integration potential. Today, Burn could easily find the functionality he needs in either SAP or PeopleSoft. But if he wanted to install the same pieces he has now, the challenge—and the outcome—would not be much different. Neither SAP nor PeopleSoft has built bridges between their applications; the competition between them precludes it, and the software industry is not known for taking strong positions on universal standards. This continuing division forces Burn to say exactly what the ERP salespeople want to hear: "Today, we would absolutely go with one vendor or the other."

This dissatisfaction has brought a new and much-needed focus to the front end of ERP projects. "There is a complete turnaround in the evaluation process for ERP," says Gilbert Garcia, director of process industries for the Americas at Menlo Park, Calif.-based The Baan Co., one of the leading ERP vendors. "Two years ago, you could come in with a fictitious demo, and customers would still buy the software. Now vendors do tightly scripted five-day demos using the customer's processes. If there's integration involved, a lot of CIOs are asking vendors to guarantee the integrated solution." And CIOs are bringing in consultants earlier in the project to help them select the software as well as implement it.

But what are CIOs to do if the big ERP packages do not meet their needs? None of the big integrated packages had what it took for Jay W. Shreiner, senior vice president and chief information officer for

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cereal and convenience food producer Kellogg Co. in Battle Creek, Mich. He elected to walk the path that Burn endured in a forced march. He chose the best-of-breed strategy of choosing multiple vendors and multiple products and hooking them together. Experts have dismissed best-of-breed as "a never-ending integration, support and vendor management nightmare," according to Bobby Cameron, senior analyst in the packaged applications strategies service at Forrester Research Inc. in Cambridge, Mass.

For Shreiner, dismissing best-of-breed is like dismissing the way most manufacturing companies design and assemble their products. Why, he asks, shouldn't a computer system reflect the business it serves? "Companies are capable of manufacturing so many different products today because they use a component manufacturing model—many different parts engineered to a single vision. We're using that model for our implementation."

The key, Shreiner says, is buying the best software components available and combining them with the best integration available—the single vision part of the equation. "I would classify this as being beyond best-of-breed," he says. "This is integrated best-of-breed."

The most ambitious purveyor of the "assembled" solution today is Oracle Corp., which has developed a product for the consumer packaged-goods industry appropriately called Oracle CPG. Oracle sells the product as a single, integrated piece of software, but under the hood are chunks of software from four different vendors (including Oracle itself). Oracle guarantees that Shreiner will not have to mess with or support the integration himself. And if he has a problem with any of the chunks, he calls Oracle rather than the software vendor that wrote the application.

Shreiner's plans are ambitious, to say the least. As Kellogg reorganizes its computer systems into a global structure from its current country-based structure, Oracle CPG will be installed in all four regions—Europe, North America, Latin America and Asia-Pacific. Shreiner expects the implementation of the entire Oracle CPG suite to take from three to five years, with each of the regions implementing the pieces in the sequence that best matches that region's business needs.

"As a CIO, I wouldn't want to be responsible for integrating all these packages together myself, but this is Oracle's core competence," he says. Shreiner is counting on Kellogg's 13-year relationship with Oracle and the strength of Kellogg's current systems to help him through the next few years of getting the ERP system up and running.

Enter Supply Chain Solutions

Companies like Kellogg are willing to take on ERP because the software goes to the heart of their businesses. If the automation extends all the way to the supply chain, the rewards flow to every part of the business. In this vein, CIOs are turning to supply chain management software—a niche product until recently—to help with their ERP implementations. "Linking your different accounting departments with ERP isn't trivial, but it is pretty close," says Cameron. The real payback, says Cameron, comes from bringing ERP down to the supply chain and combining it with what's known as "supply chain optimization" (SCO) software. Some companies are using this new piece to ease the integration of the old ones.

Simply put, SCO is the brain to ERP's brawn. For example, ERP cannot tell you whether there is enough glue left to construct the 100 widgets promised to the customer by next week; it just assumes you have all the glue you need. But specialty SCO vendors like Red Pepper Software Co. and Numetrix Laboratories Ltd. not only tell you how much glue you have but how much you will need next week and how many widgets you can expect to sell next month. At this level, companies are not simply automating, they are optimizing: reducing inventory turns, improving product delivery schedules and building better relationships with customers. "ERP awakened the one-button dream, but the software couldn't deliver," says Cameron. "Supply chain software can. That's how you get optimization and quick response throughout the organization."

Advice from those who've been there

Don't Go down a Blind Alley with ERP

- Choose one package for "the core processes."
- Spring for the integration services when buying multiple packages.
- Ask vendors to guarantee that their interfaces work between competing products; if they don't, you could face huge support costs.
- Find out how the vendor defines "partnerships" with other vendors and consultants.
- Look for consulting partners that have implemented all the packages you've chosen.
- Measure the processes before you begin; you can't measure the ROI if you don't know where you're starting.
- Remember that there's strength in numbers. Collaborate with your competitors to influence an ERP vendor's software development.

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For Hewlett-Packard Co.'s PC division in Cupertino, Calif., that "organization" is composed mostly of external manufacturers and suppliers, linked together by various EDI packages, including a proprietary version developed by HP. If you want to be a supplier or manufacturer for HP, you need to open your system spigots and let data flow to HP's manufacturing facility. "We have direct control over very little in the supply chain, but we have influence over a lot of it," says Tom Davis, project manager in the supply chain planning group of the PC division's home products line.

Linking HP's suppliers and manufacturers together electronically forms a rudimentary setup that works similarly to an ERP system. It incorporates data from suppliers' ERP systems into HP's data warehousing system that Davis can then manage with supply chain management software from Red Pepper (which, not surprisingly, was acquired by PeopleSoft Inc. a year ago.). With the software, "we can get an image of what's going on in the factory even if we don't own it," he says. "The software allows us to match up our physical capability to move products from point A to point B with customer demand. It exposes the points of friction in the system. It knows when we won't have parts available for 10 days, or where we've violated a policy constraint, such as order shipping time."

"There are a lot of ERP projects being declared a success that are not." *–Vinnie Mirchandani*

Food giant Nabisco Inc., has used supply chain management software for years. Trouble is, there are too many supply chains to manage. Rick Blasgen, the Parsippany, N.J., company's senior director of product supply, says his position was created from the merger between Standard Brands and Nabisco in 1981. Ever since the merger, Nabisco has maintained the separation; only the names have changed. Nabisco Biscuit Co. handles the cookie supply chain, and Nabisco Inc.—the old Standard Brands—handles everything else, like Life Savers candy and Planters peanuts.

The two supply chains pass each other like ships in the night, handling the same basic functions in different ways. The cookies are handled end to end, from the bakeries to the supermarket shelves, while Blasgen's unit gets products to the grocery chains' distribution centers, where the chains take over. He dreams of being able to mix cookies in with the peanuts and vice versa but so far can do that only by hosting a party in his living room.

The choices that each company makes about ERP software will determine whether the two supply chains will ever merge. Currently, both companies are evaluating SAP. "In the future, supply chains will be competing with supply chains," says Blasgen. "If we can integrate our supply chains a little more tightly, we can reduce our inventory turns and improve our delivery channel to customers," he adds. That will not happen, however, until Nabisco finds a common ERP path for two separate supply chains.

Success Is Still a Question Mark

At least Nabisco will have the benefit of learning from other people's mistakes as it considers its options. But even the best-planned ERP projects still carry tremendous risks for CIOs, evident in the challenges that lay ahead for even its most vociferous advocates. The ROI from these projects can get a little hazy when compared with the staggering installation and consulting costs. "There are a lot of ERP projects being declared a success that are not," says Vinnie Mirchandani, a research director with Gartner Group Inc.'s technology applications group in Stamford, Conn. Gains will be limited unless the company standardizes its data languages and interpersonal communications standards, he argues. "Without major rationalization of data across business units, some of those 'successes' are returning nothing or even less than nothing on the investment," adds Mirchandani.

The ROI risk is compounded by constant shifts in the ERP marketplace. The packages change so rapidly that CIOs cannot afford to commit themselves to a single vendor. The vendors they do choose must support open, flexible integration with other products and must commit to keeping up with broader technology changes such as the sudden explosion of the Internet. The addition of supply chain software to the equation may add a level of complexity rather than comfort.

But there is one way to improve the odds for a successful ERP implementation: Stack the deck with improved business processes. Simplifying key processes and improving the organizational structure of the company will help pay for the new ERP system. Creating a standard data language to communicate with suppliers both inside and outside the company will not only reduce the complexity of an ERP installation but will improve the speed and effectiveness of the processes themselves. And never lose sight of the business goals driving an ERP project in the first place. "Getting ERP installed isn't the same as satisfying business goals," warns Mirchandani.

Companies will never reach these goals unless CIOs can navigate the no man's land that still exists between ERP packages. For now, most of the borders remain closed and the crossings complex and uncertain. CIOs must proceed at their own risk. CIO

Senior Editor Christopher Koch can be reached at ckoch@cio.com.

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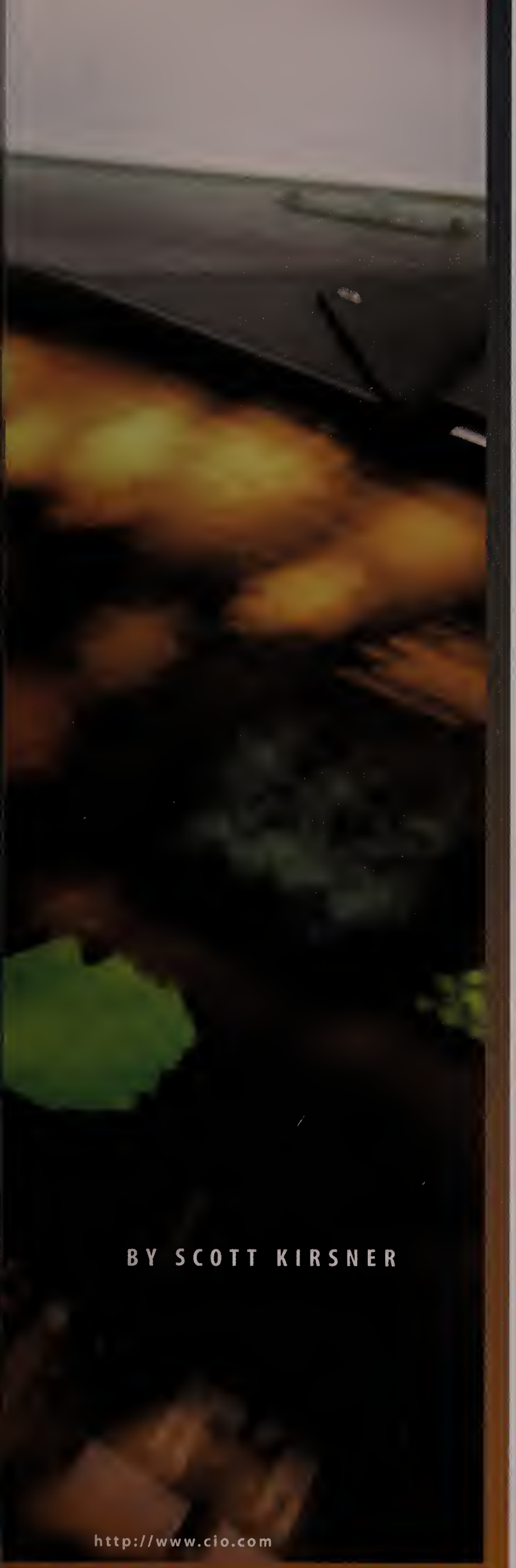


Item: American Airlines' technology group sent out nine RFPs for an assessment of its Y2K vulnerability, and only three came back.

Item: Service providers have so many projects to choose from, reports John Bace of Gartner Group Inc., that they're building quarterly price-escalation clauses into their contracts—and getting away with it.

Reader ROI

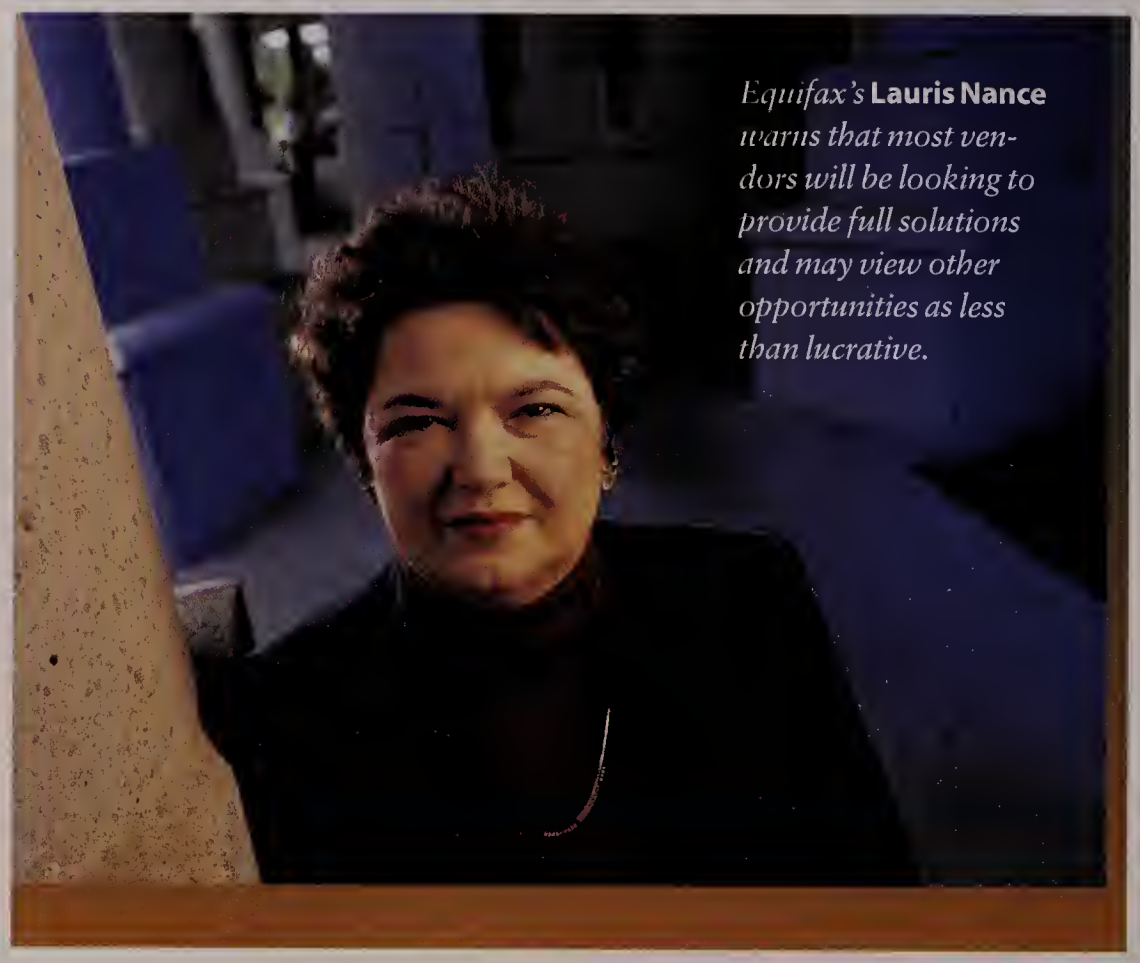
THE IMPENDING DEADLINE of the 21st century is putting Y2K vendors and consultants in the driver's seat. As a CIO, you may be desperate for help, but you don't want to get taken for a ride. In this article, you'll learn how to

- Gauge your needs for outside contractors
- Evaluate vendors' tools and services
- Negotiate the best contract
- Maintain a good relationship beyond 2000

Item: Comdisco, a Rosemont, Ill., technology services company that leases Y2K testing-capability packages at rates of up to $100,000 a day, expects to have booked all available pre-millennial testing time by next fall.

Item: The American Stock Exchange and de Jager & Co. have even created the de Jager Year 2000 Index—named after tireless consciousness-raiser Peter de Jager—to let risk-hungry investors gamble on the fortunes of 18 Y2K-focused companies.

PHOTO BY DANNY TURNER



Equifax's **Lauris Nance** *warns that most vendors will be looking to provide full solutions and may view other opportunities as less than lucrative.*

For established vendors, Y2K is a gargantuan growth opportunity. For the newer ones, it's a chance to get a foot in the door. And vendors of all sizes—not to mention the conference and seminar companies—are thriving on the confusion in the marketplace. "You could see this as a gold mine," says one consultant, whose company suddenly finds itself spending 90 percent of its time on Y2K work, "but I look at it as a fair opportunity to build a business."

Calling In the Cavalry

Many IT executives' first impulse, due to the scope and looming deadline of the Y2K project, is to call in the cavalry. But David Ortiz, a vice president at management consultant Booz, Allen & Hamilton Inc. in New York City, says that bringing in a swarm of reinforcements can cause clashes with an organization's culture. And outsourcing too much can be counterproductive. "Some organizations get nervous when they

"We asked vendors how many customers have paid them for this tool to do Y2K and how many users do they have in place. That shortened the list very quickly."

–Bill Helmstetter

IT executives see things differently. Their first concern is making sure their business survives the transition from 1999 to 2000. That requires three important skills made more crucial by the urgency of the situation. Here's what you need: an ability to determine where outside help will be most effective and how much is necessary, a rigorous vendor evaluation process and, finally, some hard-nosed contract-negotiation skills.

send code to a contractor," Ortiz says. "And the result is they wind up redoing the work because that's what the tech group needs to do to feel comfortable." His advice: "Determine what level of outside involvement you can accept."

At Fleet Financial Group in Boston, with 55 million lines of code in 300 mission-critical applications used at some 1,200 branches around the Northeast, Manager of Y2K Research Bill Helmstetter determined that he needed some outside assistance, but he opted not to outsource any significant pieces of work. Fleet brought in a vendor to help set up a code conversion factory and provide tools for finding, fixing and testing date-related bugs.

"Your reliance on outside vendors depends on the strength of your IT shop," says Helmstetter, who also serves as vice president of Fleet Technology Solutions, Fleet Financial's Boston-based technology group. "It may be that you need someone to provide bodies or tools; or if you're not good at running big projects, then you may need to bring in project management expertise." Fleet recently acquired two other financial institutions—this past summer, the company completed an integration of 700 computer systems and 564 branches from NatWest Bank NA and Shawmut National Corp.—so project management hasn't been an issue. "We have lots of people comfortable with running big conversion projects," Helmstetter says.

Although Fleet has chosen to keep its project largely in-house, Ortiz says companies with fewer than 10 million lines of code might want to explore the possibility of simply turning over an application or a suite of applications to an outside vendor. But even when Y2K conversion can be outsourced, there are some caveats. "If there was one element I wouldn't outsource, it would be the final end-to-end testing," says Ortiz. He explains that handing off too much responsibility to an outside service provider can potentially expose a company to post-2000 lawsuits. "If you have failures, can you prove that you exercised proper due diligence?" he asks.

In the gold rush atmosphere of the Y2K marketplace, IT executives often find themselves making special efforts to entice vendors to bid on projects rather than the other way around. Susan Garcia, managing director for technol-

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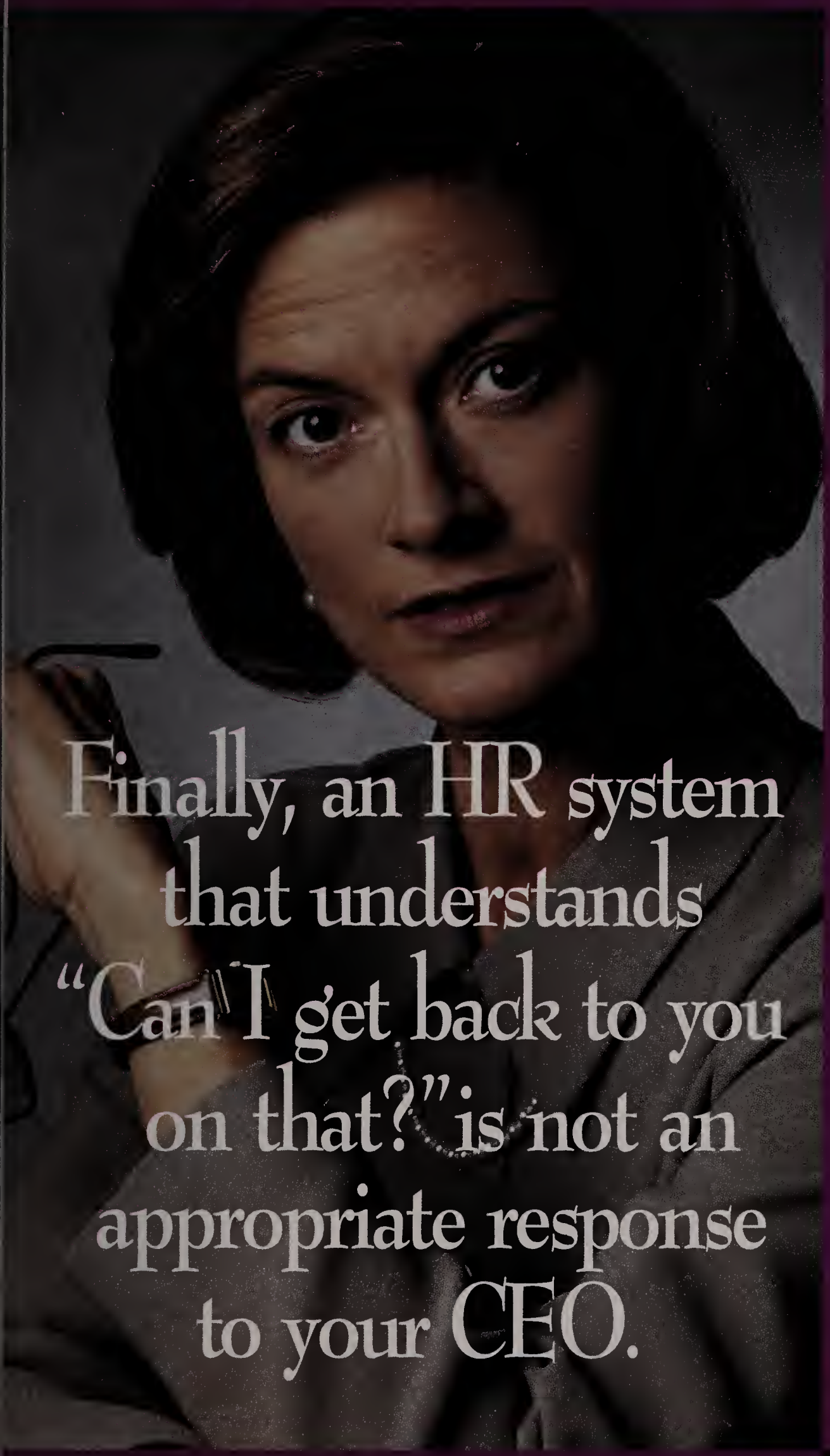
HR MANAGEMENT SYSTEMS



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ogy project management at American Airlines Inc., who works near the Dallas-Fort Worth International Airport, was stunned by the poor response to the RFPs her company sent out in cooperation with The Sabre Group Holdings Inc., its recently spun-off technology division. "[Vendors] either don't have the time to respond to RFPs, or they've got other clients that don't bother to ask for RFPs—they just sign up," she says.

Lauris A. Nance, a vice president and Y2K project executive at Equifax Inc., an Atlanta-based financial information management company, encountered similar problems. "Some of the difficulty was that we weren't looking for someone to come in and provide a full solution," she says. "And I don't blame them. They make their money off big renovations." Nance says that in sharing her experience with others in Y2K circles, she discovered that it was remarkably common: Vendors view companies shopping only for an assessment or for specific segments of the overall project as less-than-lucrative prospects.

"Most firms don't like to do assessments," agrees Garcia. "It's hard to manage the client, and there are liabilities associated. If there's no follow-on work, they're not so interested." (Eventually, American and Sabre selected Price Waterhouse LLP to assess their 1,250 systems.)

Nance says it's important to emphasize the "foot-in-the-door" element of Y2K work in order to get more companies to compete for it. "You need to establish that getting a foot in the door with your company has a lot of value if you're not looking for someone to come in and provide a full solution," she says. By doing so, Equifax found that new vendors were more eager to negotiate than were vendors it had dealt with before.

Getting the Goods on Vendors

In working with new vendors, of course, there's always the possibility of unpleasant surprises. That's why Nance put a good deal of energy into networking

Tips from the Field

Navigating the Y2K Marketplace

IT executives who have already signed vendors and launched into the conversion process have encountered more than a few problems along the way.

Problem	Recommendation
It's impossible to get the straight story on vendors by talking to only the clients on their reference list.	Vendors are unlikely to provide the names of dissatisfied clients. Find out who's not on the list and why by asking around at Y2K user groups and seminars.
Big vendors submit sky-high price estimates for tiny pieces of the Y2K project.	Since larger vendors typically use pricing models designed for large applications, you may get better results by asking smaller vendors to bid on smaller applications.
Estimates based on the number of lines of code to be converted can vary widely.	Make sure the comparisons are apples to apples. Some may include just scanning and fixing, and others may include testing and project management as well.
The Y2K project involves a number of smaller, unproven service vendors.	Explore the possibility of having a larger vendor that you've worked with before serve as a general contractor, supervising the work of the smaller vendors.
Year 2000 progress is slow because vendors can't get the guidance and input they need from staffers.	Don't underestimate the amount of staff attention required. Y2K projects can require as much as one hour of staff time for every three hours of vendor time.
The project is bogged down because source code and documentation are unavailable.	Do some serious housecleaning and archival research before the service provider starts. Organizing software libraries and documenting code will vastly speed up Y2K progress.
As the Y2K project proceeds, valuable team members are reassigned to other clients or they leave.	During contract negotiations, demand the right to approve any replacement team members.
Sparks fly between client and vendor because of differences in culture and/or methodology.	During the evaluation process, rigorously investigate the vendor's project life-cycle methodology and ask questions about its corporate culture to confirm how closely it matches yours.

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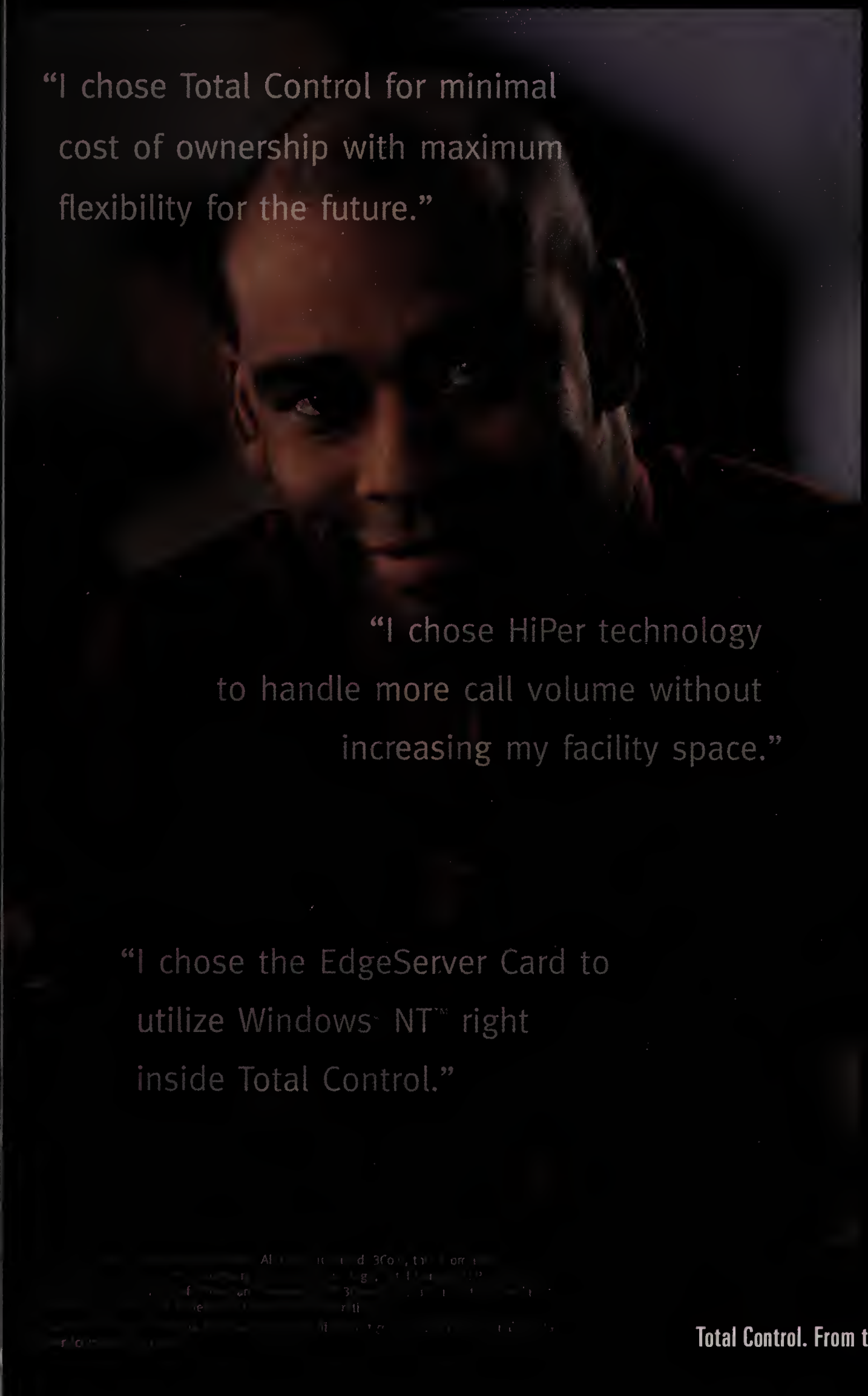

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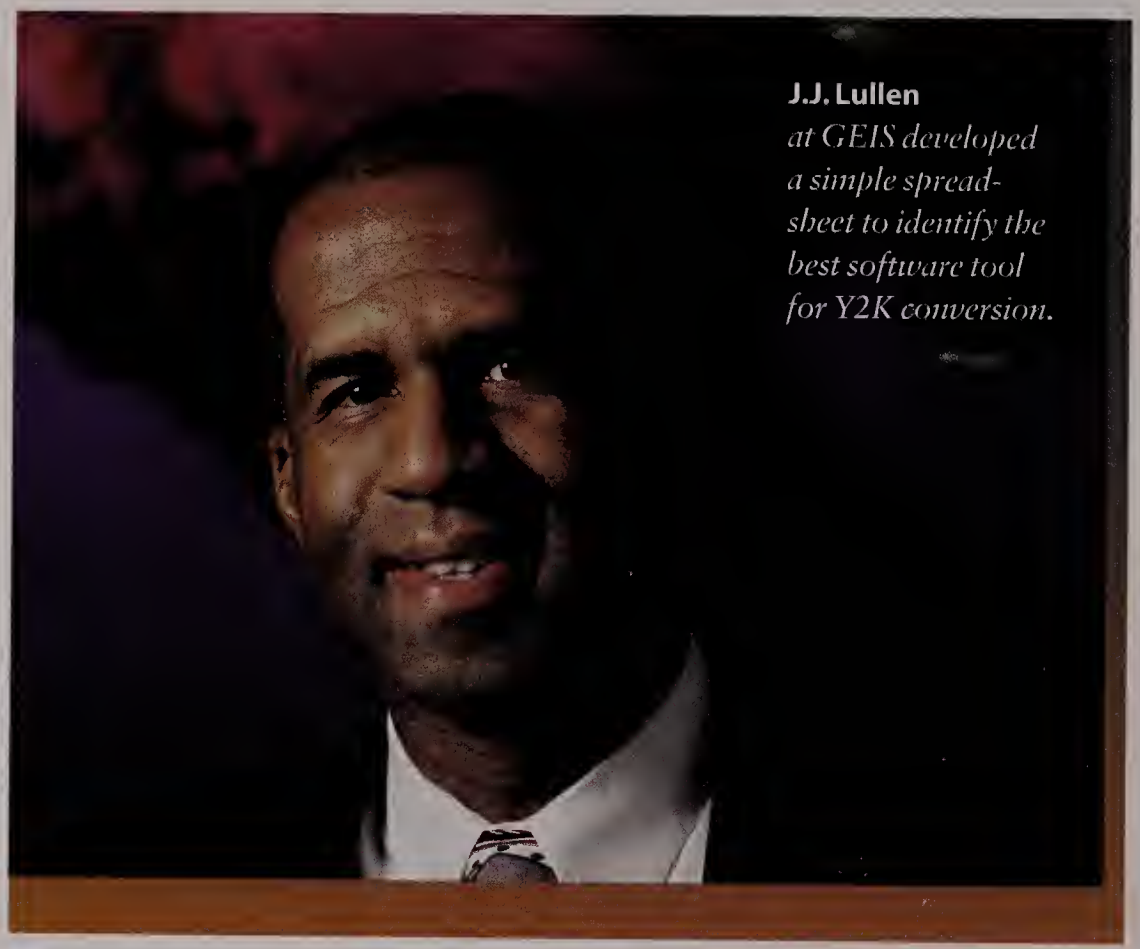
with fellow IT executives at user groups and conferences. "You need to get in touch with folks in your industry who are in the same boat," she says. The information she gleaned about different vendors' reputations and quality of work proved crucial to the evaluation and negotiation process. "It gives you power if you know the word on the street about them," Nance says.



J.J. Lullen *at GEIS developed a simple spreadsheet to identify the best software tool for Y2K conversion.*

PHOTO BY JON GOELL

Power also comes from having a solid set of selection criteria by which to judge vendors. At Fleet, the criteria for evaluating service providers included project management compatibility, correction and testing methodology, and overall comfort—"chemistry has a part in this," observes Helmstetter.

At GE Information Services (GEIS) in Rockville, Md., Project Leader J.J. Lullen developed a one-page grid to help identify the best software tool for conversion. Lullen's simple spreadsheet included columns for each of the seven vendors GEIS considered and rows for each of the 10 criteria they were rated on, including "ease of installation," "accuracy," "user interface" and "a use beyond Y2K."

Lullen's group ran its own tests of the software packages under consideration, and others recommend doing the same. Given the wave of new conversion and testing tools now hitting the market, "caveat emptor" is the phrase to live by. "When we started on the project in early 1996, you could count the number of tools on one hand," Lullen says. "Now there are hundreds."

Asking the right questions is key. Helmstetter recalls a few that he posed: "We asked vendors how many customers have paid them for this tool to do Y2K and how many users do they have in place. That shortened the list very quickly."

Helmstetter says his team benchmarked the various tools under consideration, and even Y2K-focused software vendors recommend that approach. "Send your code out and get vendors to do a proof-of-concept on it," says Mark Stabler, vice president of the year 2000 business unit at Computer Associates International Inc. in Islandia, N.Y. "Have them do a demo and provide comments about what was changed and why or why not."

In evaluating service providers that would help Fleet deploy the code-conversion software, Helmstetter made two unique decisions. First, he determined that his six-person selection panel wouldn't include just IT managers working on the Y2K project. Instead, the group was sprinkled with end users, financial types and IT people who weren't on the Y2K team. According to

Gold Rush Economics

Make sure that the people you work with now will still be around later

TONY KEYES, AUTHOR OF *The Year 2000 Computer Crisis: An Investor's Survival Guide* (The Y2K Investor, 1997), predicts a not-so-rosy future for small companies that view the Y2K problem as a windfall. While he says the market for software and services will not disappear immediately after New Year's Eve 1999, Keyes foresees consolidation as many companies replace Band-Aid fixes with more permanent solutions.

"Niche players will probably be absorbed into larger players after 2000," says Keyes.

For bigger companies, the issue won't be survival, it will be handling the growth expectations created by the Y2K gold rush. "The spike this will create is going to make it tough to sustain and build revenue after 2000," Keyes says. "These companies are going to have to do a good job of managing the investment community's expectations."

Whatever the future of its participants, there's no denying that the Y2K marketplace, which came out of nowhere and will eventually return that way, is one of the most unusual business phenomena of this rapidly waning century.

"The intensity with which this market will wash upon the global economy is really amazing," says Keyes. "I don't think we've ever seen anything like this, and I hope we never will again." *–S. Kirsner*

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Helmstetter, that let him draw on a broad range of experience during the evaluation process.

Second, he told the companies competing for his business that he wasn't interested in seeing a slick sales pitch. "We insisted that the presentations be done by the person who would be the on-site project manager," Helmstetter says. "We didn't allow salespeople to make the presentation."

It's at this point that the questions begin to fly. "You just have to interrogate them to the point that you're comfortable," says Equifax's Nance. "You [can never] ask too many questions. If people are put off by the number of questions you're asking, it's probably because they can't answer them."

"There will be tons of lawsuits over this," warns attorney **Diana McKenzie.** *She recommends documenting everything carefully.*

Negotiating the Best Deal

Everyone has a different recommendation about negotiating contracts with Y2K service providers, but all agree on one thing: It's often the service providers that wind up in the position of power. Their attitude, in many cases, seems to be that there's a surfeit of Y2K business out there, and thus they don't particularly need to play nice in contract negotiations. As a recent Gartner Group research report concluded, "The laws of supply and demand are in full force, resulting in...the sellers dictating most of the terms and conditions of the engagement."

Those economic laws are forcing some companies to make bigger upfront commitments than they might feel comfortable with. "You should sign a contract for assessment and remediation and testing all at once, so you have a guarantee that the resources will be there when the time comes," says Gartner's Bace, who is a research director in the consultancy's external services providers practice and core topic leader for Y2K service providers. Both he and Helmstetter point out that it's rare for service providers to agree to any sort of fixed-price contract or even allow the client to hold back one-third of the project cost pending completion. "Most Y2K contracts are strictly time-and-materials and pay as you go," says Bace. He adds that although penalties for delays are out of the question, bonuses for on-time or early completion aren't—and the bonuses aren't being offered for outstanding work but simply for the vendor's not jumping ship.

Diana J.P. McKenzie, a partner at the Chicago technology law firm Gordon & Glickson PC, recommends a tougher approach to Y2K contracts. When working with smaller providers, she advises, try to secure the right for other people to make changes to their software, try to work only with companies that are insured, carefully scrutinize the exclusions not covered by warranties and document everything. "You should be documenting what you're doing pretty carefully," McKenzie says. "There will be tons of lawsuits over this, and your documentation may provide legal remedies or help in your defense."

It's New Year's Day—Now What?

Once the ink is dry on the contract, of course, the project itself is just getting started. But at least the process of navigating the Y2K marketplace is over, and IT managers and their staffs can get down to the real work of preparing for the calendar flip.

What are the implications of the Y2K gold rush on vendor/client relationships? There's likely to be some pent-up hostility on the part of the clients; no one likes being in a position of helplessness, as many companies now find themselves, and no one likes cost escalation on the order of 40 percent to 50 percent a year. The Y2K project, with its unforgiving deadline and high pressure, is sure to spoil some long-standing relationships. But it also will be an opportunity to forge new ones.

The key to developing new relationships in the Y2K crucible is active oversight, according to Robert Franz, a senior vice president at Booz, Allen. "You have to really manage this exercise and stay on top of it," he says. Gartner Group's Bace agrees: "This is truly a partnership."

And it's a partnership that has serious ramifications for IT shops, in terms of how they're viewed by the rest of the company. Those that successfully negotiate the vendor minefield and work with software and services firms to ensure a stable transition from 1999 to 2000 will emerge with much-enhanced credibility. But there's a flip side, too. "This will have a dramatic and long-lasting impact," says Tony Keyes, author of *The Year 2000 Computer Crisis: An Investor's Survival Guide.* "You either lose credibility or you gain a great deal of it." There is no middle ground. CIO

Scott Kirsner, a Boston-based writer and consultant, is working on a series of articles for CIO *on the Y2K problem. He can be reached via e-mail at* kirsner@worldnet.att.net.

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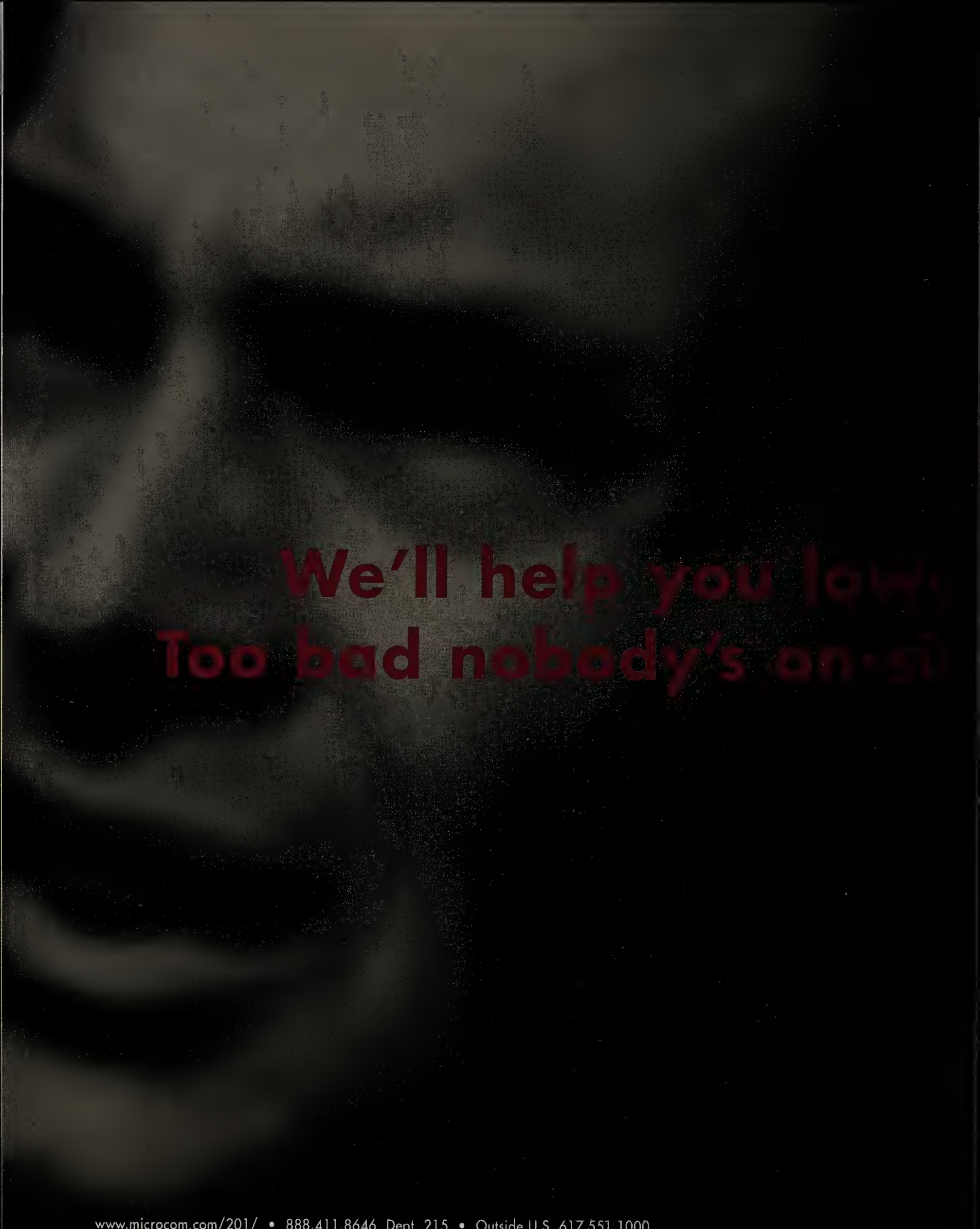

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the Year in review

An index of all major articles published in *CIO* in 1997, including a cross-reference by article type

DECEMBER 15, 1996/ JANUARY 1, 1997

Special Issue: Electronic Commerce

1225. "The Speed of Light" *(Page 42)—the challenges of transacting business on a network have historic foundations. But thanks to anywhere, any time access, the scope and pace of commerce will never be the same. An introduction by Perry Glasser*

1226. "The Electric Handshake" *(Page 48)—more than a new type of transaction, online commerce is changing the fundamental buyer/seller relationship. By Heath Row*

1227. "The Once and Future EDI" *(Page 66)—if legacy EDI software is integrated with the Web and VANs are offered by ISPs, variations on EDI will keep revitalizing this important EC tool. By Lynda Radosevich*

1228. "Sticking with Strategy" *(Page 80)—when it comes to engaging in electronic commerce, 3M is making sure each of its EC initiatives supports business goals. By Derek Slater*

1229. "Moore's Law" *(Page 92)—Geoffrey Moore's technology adoption framework can help CIOs plan for the wired markets of the future. An interview by Carol Hildebrand*

1230. "Blueprints for the Electronic Store" *(Page 32)—interactive electronic sales will call for new IT architectures and infrastructures. A Gartner View column by Barbara Reilly*

Categorically Speaking

Articles are numbered in sequence from the first issue of CIO. (See previous December issues for guides to stories published prior to January 1997.) To find articles of interest, refer to the category listings below. For example, readers interested in data warehousing would look up 1266 and 1322. The CIO.com Archive, an online index of articles dating back to September 1994, can be viewed at www.cio.com/archive. To purchase back issues or reprints, call Ancillary Products at 800 343-4935, Ext. 4539.

Business/Management Issues 1226, 1228, 1261, 1268, 1271, 1277, 1295, 1299, 1300, 1304, 1305, 1310, 1316, 1318, 1328, 1334, 1335, 1345, 1351, 1353, 1366, 1376, 1386, 1391, 1402, 1415, 1420, 1421, 1423, 1439, 1441

The CIO Role 1232, 1253, 1268, 1271, 1274, 1277, 1285, 1292, 1294, 1309, 1310, 1312, 1316, 1330, 1331, 1362, 1363, 1365, 1367, 1385, 1388, 1389, 1404, 1416, 1428

Client/Server-Open Systems 1263, 1265, 1313, 1315, 1390, 1433

Communications Technology/Networking 1242, 1245, 1252, 1291, 1319, 1323, 1338, 1352, 1370, 1374, 1396, 1397, 1433

Databases/Data Warehousing 1266, 1322, 1337, 1403, 1406, 1417, 1422

Enterprise Value/Return on Investment 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1250, 1264, 1282, 1290, 1303, 1320, 1339, 1341, 1356, 1359, 1390, 1395, 1407, 1419, 1426, 1434

Global Issues 1245, 1251, 1252, 1253, 1275, 1297, 1314, 1350, 1392, 1436

Industry Overviews 1238, 1255, 1297, 1306, 1314, 1321, 1322, 1323, 1333, 1366, 1371, 1399, 1400, 1437, 1438

Information Assets/Knowledge Management 1233, 1235, 1243, 1248, 1270, 1286, 1293, 1295, 1298, 1305, 1307, 1327, 1346, 1372, 1404, 1425

IS Strategies 1234, 1239, 1254, 1258, 1259, 1262, 1272, 1279, 1283, 1289, 1294, 1296, 1301, 1315, 1328, 1331, 1332, 1333, 1341, 1342, 1343, 1344, 1345, 1346, 1351, 1357, 1364, 1366, 1368, 1369, 1381, 1382, 1386, 1388, 1402, 1421, 1424, 1429

Online Technology/Strategy 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1261, 1263, 1280, 1285, 1311, 1324, 1334, 1339, 1373, 1375, 1376, 1377, 1378, 1380, 1381, 1382, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1417, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443

Organizational Change/Human Resources Issues 1237, 1256, 1267, 1269, 1278, 1286, 1288, 1308, 1326, 1336, 1344, 1355, 1375, 1379, 1384, 1385, 1389, 1399, 1400, 1415, 1432

Outsourcing/Supplier Relations 1276, 1287, 1385, 1393, 1398, 1430

Reengineering/Downsizing 1284, 1296, 1361

Technology Overviews 1231, 1249, 1257, 1258, 1259, 1260, 1273, 1281, 1291, 1293, 1302, 1311, 1313, 1319, 1329, 1338, 1358, 1369, 1387, 1394, 1397, 1403, 1414, 1418, 1427, 1429, 1433

User/Customer Relations 1236, 1244, 1246, 1283, 1289, 1317, 1354, 1369, 1378, 1380, 1401, 1428, 1440

1231. "EC Payment Schemes" *(Page 100)—while commerce moves across networks into the next millennium, payment methods lag behind. An Emerging Technology column by Elaine M. Cummings*

1232. "Encyclopaedia Britannica's Larry Merrick" *(Page 112)—memories of launching an online product. A Shop Talk column by Richard Pastore*

JANUARY 15, 1997

1233. "Getting In Touch with Your Inner Web" *(Page 38)—when Hewlett-Packard's corporate IS group began improving its own services via an intranet, the rest of the company couldn't help but notice. By Tom Field*

1234. "Powers of Persuasion" *(Page 46)—don't hesitate to put the squeeze on your suppliers. Influencing vendors to satisfy corporate needs is simply good business. By Miryam Williamson*

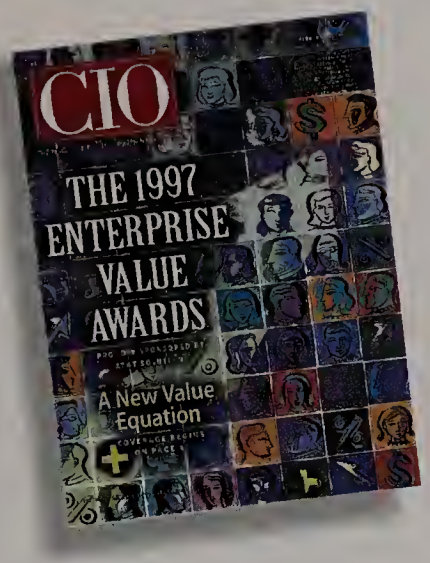
1235. "Out of the Stacks" *(Page 54)—today's vast corporate libraries come in just about every medium. But how can you avoid having your information resources gather dust? By Heath Row*

1236. "Delicate Negotiations" *(Page 30)—hammering out agreements with your staff, peers and bosses doesn't have to be a fight if you know how to bargain well. An Executive Counsel column by Margaret A. Neale*

1237. "The Skills That Thrill" *(Page 34)—tracking employee competencies can help companies recruit, match people to jobs and even develop their staffs. A Think Tank column by Tom Davenport*

1238. "Makeover Medicine" *(Page 62)—in times of crisis, a healthy dose of IT can help businesses rebound, rebuild or regain their competitive edge. A Reporter's Notebook column by Jennifer Bresnahan*

1239. "Advanced Technology Groups" *(Page 70)—if ATGs truly want to have an impact on the business, they must come down from their ivory towers. An Emerging Technology column by Jennifer Bresnahan*



FEBRUARY 1, 1997

Special Section: The Enterprise Value Awards

1240. "A New Value Equation" *(Page 40)—this year's EVA recipients possess the key elements to develop successful systems.*

1241. "Value Judgments" *(Page 46)—a panel of IS cognoscenti discusses IT systems and the businesses they support. By Christopher Koch*

1242. "A Cure for Broken Records" *(Page 54)—HMO MacGregor Medical discovered that taking good care of its patients can also be good for the bottom line. By Alice Dragoon*

1243. "Semper Fidelity" *(Page 62)—a client/server system means peace of mind for customers and a competitive advantage for Fidelity Investments. By Jennifer Bresnahan*

1244. "A Good Connection" *(Page 70)—Bell Atlantic improves communication and profits by cutting the static between salespeople and customers. By Tom Field*

1245. "Net Results" *(Page 78)—a worldwide corporate network based on TCP/IP helps Schlumberger's clients strike oil. By E.B. Baatz*

1246. "Banking on the Relationship" *(Page 84)—IS helped Chase Manhattan develop more profitable relationships with its small and midsize business customers. By Tom Field*

1247. "Software Economics 101" *(Page 32)—studying the world's software development trends can help CIOs make the grade. A Metric Systems column by Howard A. Rubin*

1248. "Adapt or Die" *(Page 36)—to value IT properly requires viewing the enterprise as an evolving ecosystem. A Meta View column by Dale Kutnick and Karen Rubenstrunk*

1249. "Integrated Messaging" *(Page 90)—the benefits of integrated messaging are compelling, but early adopters must consider a number of issues before making a decision. An Emerging Technology column by Curtis F. Franklin Jr.*

1250. "Texas Department of Human Services" *(Page 102)—as a result of going electronic, the state of Texas and the federal government have saved millions of dollars and taken a big bite out of fraud. A Working Smart column by Paula Jacobs*

FEBRUARY 15, 1997

Special Section: IT in South America

1251. "Sud América" *(Page 48)—when the boss distrusts IT, a dial tone is a sometimes thing and the software is in a foreign language, it's just another day in the life of a South American CIO. By Peter Fabris*

1252. "Along the Andes" *(Page 56)—early market reforms and state-of-the-art telecommunications leave companies in Chile uniquely positioned to take advantage of the latest in IT. By Peter Fabris*

1253. "Southern Exposure" *(Page 62)—the roles of IT and information executives are gaining importance in South America as competition in the region's markets heats up. By Peter Fabris*

1254. "Quantum's Leap" *(Page 40)—one computer manufacturer's risky decision to overhaul its worldwide business systems in a single bound paid off. By Lynda Radosevich*

1255. "Auto Pilot" *(Page 70)—the auto industry is using IS to help retain existing customers and improve customer loyalty. A Preparing for Change feature by Dan Gross*

1256. "Minimal Assistance" *(Page 32)—want to reskill your employees? Then you have to deliver on management's meaningless slogans. An Executive Counsel column by Christopher Koch*

1257. "Data and Telecommunications Convergence" *(Page 78)—CIOs feel pressure to consolidate data, telephony and video technologies. An Emerging Technology column by John Edwards*

MARCH 1, 1997

Special Report: Software Reuse

1258. "More Lives Than a Cat" *(Page 34)—IS shops that institute component-based development reduce failure, embrace efficiency and augment the bottom line. An introduction by Miryam Williamson*

1259. "Avoiding the Point of No Reuse" *(Page 38)—CIOs who've been there say reaping the benefits of software reuse hinges on overcoming a bevy of cultural barriers. By Miryam Williamson*

1260. "Bits and Pieces" *(Page 56)—different kinds of component-based development still require the same technology. By Miryam Williamson*

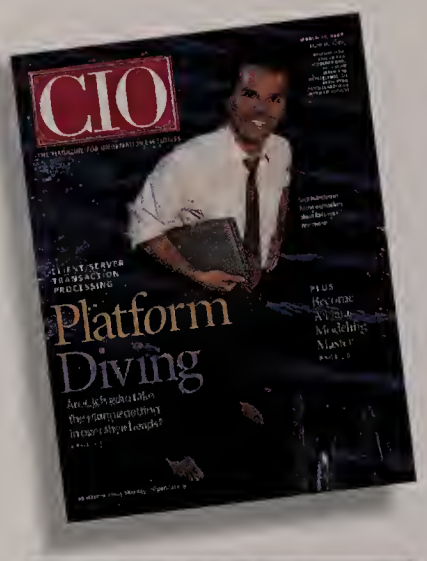
1261. "To Catch a Thief" *(Page 68)—security veteran Bill Hancock helps CIOs safeguard company secrets by finding loopholes in networks, firewalls and building security. An interview by Jennifer Bresnahan*

1262. "Once Is Not Enough" *(Page 28)—embarking on a reuse program requires more than simply announcing the program's existence. A Gartner View column by Richard Hunter*

1263. "Beyond Client/Server" *(Page 74)—are Web-based applications "client/server done right"? An Emerging Technology column by Curtis F. Franklin Jr.*

1264. "Clawson Concrete's Fleet-Tracking System" *(Page 84)—streamlining the dispatch process increased delivery rates and accuracy and improved customer service. A Working Smart column by Derek Slater*

STORY INDEX



MARCH 15, 1997

1265. "Platform Diving" *(Page 44)—heavy-duty transaction processing can be done in a client/server environment that's built for the right task and the right number of users. By Derek Slater*

1266. "Blueprint for Success" *(Page 56)—smart organizations are using data models to escape the snares of data warehousing. By Jennifer Bresnahan*

1267. "Team Payers" *(Page 68)—IS groups may respond better to new group compensation schemes. By Derek Slater*

1268. "Just Thinkin' About Tomorrow" *(Page 78)—MIT researchers look to the future to prepare for business for the 21st century. An interview by Richard Pastore*

1269. "Inside and Out" *(Page 26)—leading change requires looking beyond an organization's walls. A Change Agent column by Carol Hildebrand*

1270. "Processing Process Information" *(Page 32)—know much about how your company gets work done? A Think Tank column By Tom Davenport*

1271. "The CEO Agenda" *(Page 36)—some CEOs who attended the Fortune 500 Forum realize the strategic importance of IT, but they're not so certain about their CIOs. A Reporter's Notebook column by Lynda Radosevich*

1272. "The Lease You Can Do" *(Page 82)—giving finance the lowdown on IS leasing can save money. An Expert Advice column by James M. Johnson*

1273. "Global Positioning Systems" *(Page 86)—PCMCIA cards are transforming GPS into an everyday business tool. An Emerging Technology column by John Edwards*

1274. "Aetna's Glen Salow" *(Page 100)—the CIO as a blue-collar worker. A Shop Talk column by Elaine M. Cummings*

APRIL 1, 1997

1275. "Far From the Bank on the River Charles" *(Page 36)—economic growth throughout South America poses some welcome problems for BankBoston's information executives. By Peter Fabris*

1276. "Caveat Emptor: An Outsourcing Buyers Guide" *(Page 46)—the right choice requires a sound strategy for distinguishing and deciding among the bewildering array of vendors. By Tom Field*

1277. "Taking Care of Business" *(Page 62)—the eighth annual CIO/Ernst & Young survey reveals that CIOs and their bosses and peers are beginning to agree on the strategic role of the top IS executive. By Heath Row*

1278. "A Good Staff Is Hard to Find...and Keep" *(Page 76)—IS executives and consultants discuss the challenges of—and strategies for—doing both. By Richard Pastore*

1279. "Farewell to the Big Bang" *(Page 32)—vendors, users and executives alike will have to adjust to new rules as component-based packaged applications make rollouts ongoing affairs. A Forrester View column by Bobby Cameron*

1280. "Webel Without a Clue" *(Page 84)—entrepreneurial heavyweight Ezra Poundcake describes his rags-to-slightly-higher-quality-rags career on the Net. A CIO Light column*

1281. "Real-Time Collaboration Tools" *(Page 90)—CIOs working with an increasingly mobile workforce look to group decision support. An Emerging Technology column by Heath Row*

1282. "Amdahl's Sales Compensation System" *(Page 102)—this company turned to an integrated system to motivate salespeople. A Working Smart column by Paula Jacobs*

APRIL 15, 1997

1283. "Weighing the Nos and Cons" *(Page 48)—trying to figure out how to set priorities for IT projects? Start with a spreadsheet. By Miryam Williamson*

1284. "Getting the Lead Out" *(Page 62)—by standardizing IS operations and cutting costs, Mobil honed its competitive edge. By Daniel Gross*

1285. "Web War" *(Page 74)—when webmasters and CIOs clash, the chaos rivals that of a bad B-movie. By Carol Hildebrand*

1286. "The Next Wave" *(Page 84)—a consultant details what he calls the "Third Revolution." A book excerpt by Michael L. Dertouzos*

1287. "Lump It and Like It" *(Page 32)—fixed-price consulting can prevent pricing woes. An Executive Counsel column by Christopher Koch*

1288. "Storming the Ivory Tower" *(Page 38)—universities and companies need to learn to work together better. A Think Tank column by Tom Davenport*

1289. "Numbing Your Rollout Pain" *(Page 42)—systems reengineering rollouts should be structured around user needs. An Expert Advice column by Britta Schatz and Karen Finigan*

1290. "Case in Point" *(Page 96)—participants at CIO's recent Enterprise Value Retreat advised a family business how to stay competitive. A Reporter's Notebook column by Tom Field*

1291. "Is ISDN Soup Yet?" *(Page 106)—high-speed data transfer technology comes of age. An Emerging Technology column by John Edwards*

1292. "Bose Corp.'s Warren Harkness" *(Page 118)—a total quality manager talks about life beyond IS. A Shop Talk column by Richard Pastore*

MAY 1, 1997

1293. "Push IT" *(Page 58)—push technology is not hassle-free, but you can't afford to ignore it. By Lynda Radosevich*

1294. "A Tough Sell" *(Page 74)—devising the ideal infrastructure plan is half the battle. Convincing management to invest in it can be even harder. By Christopher Koch*

1295. "The Data Game" *(Page 90)—companies are learning how to turn customer information into product—and profit. CIOs need to help call the plays. By Derek Slater*

1296. "A Powerhouse Lightens Up" *(Page 98)—Westinghouse Electric needed a new computing infrastructure before the lights went out. But IS had to fix itself first. By Tracy Mayor*

1297. "Oil Under Pressure" *(Page 110)—virtual reality and co-opetition are making oil exploration a less slippery business. A Preparing for Change feature by Gene Koprowski*

1298. "Reap What You Know" *(Page 118)—can you really "manage" what people know? Some CIOs are trying to find out. By Christopher Koch*

1299. "The Greenhouse Effect" *(Page 38)—isolating change gives employees the freedom to experiment with new processes—and the opportunity to learn from mistakes without affecting the bottom line. A Change Agent column by Carol Hildebrand*

1300. "Capturing Innovation" *(Page 50)—most people have preconceived ideas about how innovation occurs. A new study debunks some of the myths. An Expert Advice column by Mary Silva Doctor*

1301. "Three Architectural Sins" *(Page 124)—when setting up an architecture, always keep the basics in view. A Meta View column by Larry R. DeBoever and Richard D. Buchanan*

1302. "Virtual Reality" *(Page 128)—practical uses give a soft science a good name. An Emerging Technology column*

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STORY INDEX

by John Edwards

1303. "Pride Enterprises' CIM System" *(Page 142)—this system centralized processing for a Florida company charged with managing the state's prison industries. A Working Smart column by Heath Row*

MAY 15, 1997

1304. "Share & Share Alike" *(Page 48)—the time is right for CIOs to consider introducing their organizations to shared services. By Tom Field*

1305. "Up Close and Personal" *(Page 62)—new technologies make data collection easier, but they also may violate consumers' sense of privacy. By Jennifer Bresnahan*

1306. "Degrees of Change" *(Page 78)—the new demands of higher education are pushing the IT grading curve. By Megan Santosus*

1307. "The Bigger Picture" *(Page 88)—this new book asks us what we want from information and provides a sane approach to how to get it. A book excerpt by Tom Davenport*

1308. "The People Side of Change" *(Page 100)—panelists at a recent CIO Perspectives conference share their experiences, strategies and mistakes. A roundtable by Abbie Lundberg*

1309. "The Honeymooners" *(Page 36)—the experiences of two CIOs suggest strategies the newly hired can pursue to keep the bloom on the rose. An Executive Counsel column by Cheryl Dahle*

1310. "Alignment Revisited" *(Page 44)—if you build the right model and commit to the change, you can finally link the strategy of business and IT. An Expert Advice column by Laraine Rodgers*

1311. "Enter the Extranet" *(Page 106)—what can organizations gain from including outsiders in their intranets? An Emerging Technology column by Curtis F. Franklin Jr.*

1312. "Rosenbluth's Dean Sivley" *(Page 118)—marrying the marketing and IS functions. A Shop Talk column by Richard Pastore*

JUNE 1, 1997

1313. "NC: The New Wild Frontier?" *(Page 42)—experts say network computers will integrate with PCs, not replace them. By Carol Hildebrand*

1314. "Competition Calling" *(Page 58)—telecommunications companies strive for customer loyalty in a cutthroat market. A Preparing for Change feature by Christopher Koch*

1315. "By Remote Control" *(Page 72)—without proper planning, enterprise systems management is a migraine waiting to happen. By Derek Slater*

1316. "Are We There Yet?" *(Page 86)—for the third consecutive year, CIOs responding to CSC's annual IS survey rank aligning IS and corporate goals as the top concern. By James P. Saviano*

1317. "The Press for More Options" *(Page 30)—soon companies will need to expand their call centers' capabilities or risk losing business. An Expert Advice column by David M. Rappaport*

1318. "The Technology Democracy" *(Page 38)—a "democratic" model of technology governance encourages creativity and growth. A Forrester View column by Waverly Deutsch*

1319. "Look Ma, No Wires!" *(Page 100)—with wireless technology, remote access just got easier. An Emerging Technology column by John Edwards*

1320. "Lowell General Hospital's Internet Solution" *(Page 112)—a Massachusetts hospital is using the Internet to educate local consumers. A Working Smart column by Megan Santosus*

JUNE 15, 1997

Special Report: Health Care

1321. "Medical Exam" *(Page 42)—this special report on the health-care industry looks at how providers are using IT to improve the health of their patients—and their businesses. An introduction by Jennifer Bresnahan*

1322. "A Delicate Operation" *(Page 44)—the experiences of those in the business of curing patients could help you come up with a prescription for a healthier business. By Jennifer Bresnahan*

1323. "Managed Share Networks" *(Page 58)—here's how three health-care organizations are overcoming the obstacles to effective information sharing. By Tom Field*

1324. "EC Riders" *(Page 70)—how can you streamline your supply chain to include business partners? The answer lies in electronic commerce. By Peter Fabris*

1325. "Six Months in Review" *(Page 82)—an index of all major articles published in CIO in the first six months of 1997, including a cross-reference by article type.*

1326. "Cutting Deals with HR" *(Page 30)—paying staff what they're worth means selling HR. An Executive Counsel column by Christopher Koch*

1327. "Known Evils" *(Page 34)—repent and save your company from its witless ways. A Think Tank column by Tom Davenport*

1328. "The Sky Is Not Falling" *(Page 92)—stocking up on canned goods and shotguns may not be the best strategy for confronting the year 2000 problem. An IDC View column by Thomas D. Oleson*

1329. "The Smallest Systems" *(Page 98)—scoping out the future of palmtops in the enterprise. An Emerging Technology column by Curtis F. Franklin Jr.*

1330. "Penn Mutual's Susan Kozik" *(Page 110)—enterprisewide customer service. A Shop Talk column by Elaine M. Cummings*

JULY 1997

1331. "Administrative Progress Report" *(Page 40)—the federal government's newly*

appointed CIOs participate in a roundtable discussion about their roles, challenges and early successes. By Tom Field

1332. "IT Reformer" *(Page 48)—the GAO's Chris Hoenig is keeping tabs on how the government handles IT investments. By Richard Pastore*

1333. "Postcards from Near the Edge" *(Page 52)—an accidental tourist details the IT infrastructure behind the New York-New York Hotel & Casino, DreamWorks SKG and Carnival Cruise Lines. By Nevin Grimsley*

1334. "Tools of the Trade" *(Page 70)—how does Snap-on share information with its dealers and franchises? With DSS On-Line, it's a snap. By Elaine M. Cummings and Miryam Williamson*

1335. "For Richer, For Poorer" *(Page 84)—it may seem pessimistic in the first flush of a new partnership, but companies should also plan for an alliance's dissolution. By Miryam Williamson*

1336. "Something to Talk About" *(Page 30)—chatting honestly about workplace issues—and encouraging your staff to do the same—can keep problems in perspective. An Executive Counsel column by Cheryl Dahle*

1337. "Can Data Marts Grow?" *(Page 34)—there are guidelines to follow and warnings to heed when building a data mart. Listen up, and get it right the first time. A Gartner View column by Kevin Strange*

1338. "Remote Access" *(Page 94)—a growing offsite workforce makes a fast, reliable*

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external network access strategy the newest business imperative. An Emerging Technology column by John Edwards

1339. "Broderbund Software" *(Page 108)—this company instituted Web-based technical support to aid its customers at any hour. A Working Smart column by Debby Young*

AUGUST 1997

Special Issue: The CIO-100 Top IT Performers

1340. "The 10th Annual CIO-100: Top IT Performers" *(Page 41)—excellence is the product of hard work and vision. By Carol Hildebrand*

1341. "The Nature of Excellence" *(Page 46)—IS organizations that receive the CIO-100 award lead in building systems, serving their companies and creating genuine business value. By Carol Hildebrand*

1342. "Ensured Stability" *(Page 62)—can you upgrade your infrastructure without affecting your company's productivity? USAA answers its own $105 million question. By Tracy Mayor*

1343. "Service Ace" *(Page 72)—at Elf Atochem, IS helps its customers make the right technology decisions, and that's the secret to keeping everyone happy. By Richard Pastore*

1344. "The Arts of Kraft" *(Page 82)—with innovative personnel policies and a commitment to improving management strategies, Kraft Foods keeps its IS function running smoothly. By Peter Fabris*

1345. "Banking on Bonds" *(Page 94)—now that Chase Manhattan's IT organization is lined up perfectly with business goals, the system is the business and the business is the system. By Tom Field*

1346. "Armed With Intelligence" *(Page 104)—shared knowledge is the Department of Defense's not-so-secret weapon. By Perry Glasser*

1347. "Looking Back" *(Page 113)—in 10 years, IS has moved from a support service to being central to the business. A retrospective by Megan Santosus*

1348. "Leaders in IT Excellence" *(Page 124)—from providing sound infrastructure to creating a learning culture, the CIO-100 honorees exemplify excellence in an IS organization.*

1349. "1997 Index of Articles" *(Page 146)—an index of all major articles published in CIO in the first eight months of 1997, including a cross-reference by article type.*

SEPTEMBER 1, 1997

1350. "Uneasy Money" *(Page 46)—preparing an IT shop for a single European currency means outguessing political and economic trends for each member of the European Monetary Union. By Malcolm Wheatley*

1351. "A New Balance" *(Page 54)—when Bank of Boston acquired BayBanks Inc., it adopted the smaller bank's business strategies and IT systems. By Peter Fabris*

1352. "Putting the LAN in the Can" *(Page 68)—when food giant Cargill Inc. mandated standards, a regional office solved a few problems that sprouted up. By Marsha Johnston*

1353. "Habits of the Lethal Consultant" *(Page 80)—a consultant describes how to involve clients and provide results. By Robert H. Schaffer*

1354. "Design of the Times" *(Page 88)—Cognetics Corp.'s Charles Kreitzberg tells software developers that to stay competitive, they have to make more user-friendly products. By Megan Santosus*

1355. "Change Channelers" *(Page 32)—veterans who've managed IS changes successfully offer CIOs tips to transform their IS organizations as well as their management styles. A Change Agent column by Sheila Smith and Mary Silva Doctor*

1356. "Get Real on Cost of Ownership" *(Page 38)—capital and operational costs are easy to calculate, but how do you measure hard and soft benefits? A Meta View column by David Cearley*

1357. "Timing Is Everything" *(Page 94)—seizing the perfect moment to present a new technology to your company can make or break a strategic plan. An Expert Advice column by Albert Aiello Jr.*

1358. "Windows NT Scalability" *(Page 98)—is NT ready for prime time? An Emerging Technology column by John Edwards*

1359. "REI's Automated Inventory System" *(Page 112)—an efficient system factors multiple data to boost sales and control inventory. A Working Smart column by Megan Santosus*

SEPTEMBER 15, 1997

Special Issue: The Decade of the CIO

1360. "Decade of the CIO" *(Page 26)—special 10th anniversary issue introduction. By the Editorial Staff*

1361. "A Meeting of the Minds" *(Page 46)—Peter Drucker and Tom Davenport discuss the state of business and information management. By Tom Davenport*

1362. "A Day in the Life" *(Page 58)—CIO walks a mile in the wingtips of Eli Lilly's Tom Trainer, one of the country's most effective IT executives. By Alice Dragoon*

1363. "Hall of Fame" *(Page 72)—CIO chooses the 12 most influential IT executives of the past decade and the tools, technologies and systems that helped make them famous. By the Editorial Staff*

1364. "What Have You Done with IT Lately?" *(Page 114)—a new CIO/Morgan Stanley survey reveals how top IS execs spend their IT dollars. By Derek Slater*

1365. "Great Expectations" *(Page 122)—growing companies and changing times make tomorrow a challenge for today's new CIOs. By Tom Field*

1366. "Leaders of the Information Age" *(Page 136)—meet the visionaries conceiving, building and delivering the technology that will propel business into the next millennium. By the Editorial Staff*

1367. "A Quantity of Qualities" *(Page 40)—as the role of the CIO expands, so does the list of attributes that make a good one. An Expert Advice column by Michael J. Earl*

1368. "Reflecting Back and Moving Forward" *(Page 184)—J.C. Penney's veteran CIO reflects on 10 years of IT innovation and predicts what lies ahead. By David V. Evans*

OCTOBER 1, 1997

CIO Section 1

1369. "Fast Fone Farms, Fat Profits" *(Page 40)—the once-humble call center is taking on strategic importance with the convergence of help desk, telesales and customer service operations. By Jim Nash*

1370. "Planning to Beat the Band" *(Page 56)—robust applications may bring ease of use and multimedia to every desktop, but if bandwidth demands escalate, a whole system can clunk to a halt. By Peter Fabris*

1371. "Minding the Stores" *(Page 70)—how do grocery retailers keep customers happy while stamping out waste and inefficiency? In the U.S. and the U.K., the answer can be very different. By Malcolm Wheatley*

1372. "Knowledge in Books" *(Page 30)—a review of some of the latest literary arrivals on the knowledge management scene. A Think Tank column by Tom Davenport*

1373. "Click Here for an Agent" *(Page 36)—Internet channels will overwhelm call centers unprepared for the rising tide of incoming e-mail, voice and even video communications. A Forrester View column by David Cooperstein*

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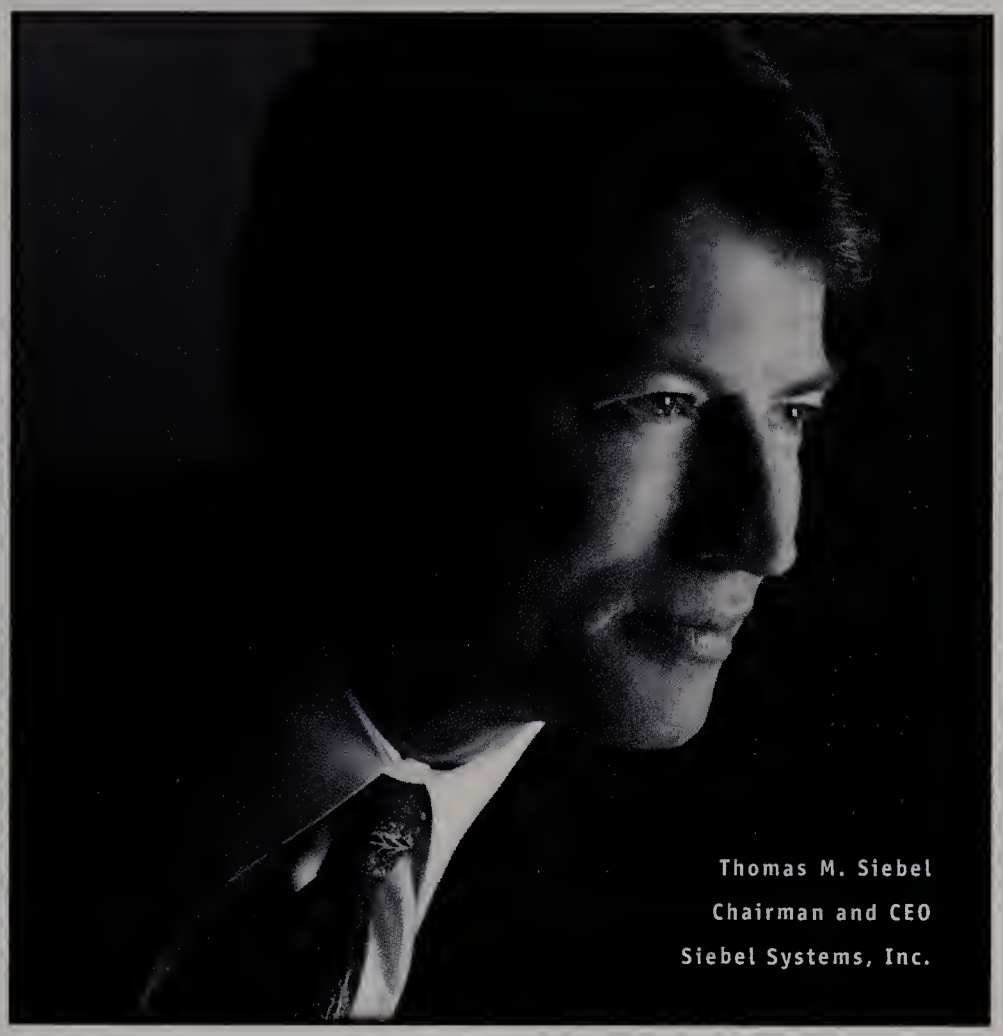

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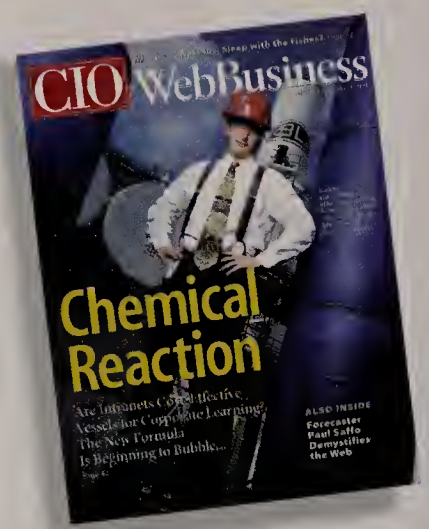
STORY INDEX

1374. "Does Multicasting Make Sense?" *(Page 80)—continuous data streams could make networks cheaper and stronger. An Emerging Technology column by Fred Hapgood*

CIO Web Business Section 2

1375. "No More Books" *(Page 42)—imagine a classroom where the learning never ends, and students are never late. By Mark Halper*



1376. "The Hole in Nets Inc." *(Page 52)—Bill Gates invested in it. Jim Manzi ran it. Internet visionaries raved about the new company's promise. Yet last May, Nets Inc. filed for bankruptcy protection. What went wrong? By Art Jahnke*

1377. "The Future Is Now" *(Page 60)—Paul Saffo holds the key to the future: Examine the past and apply it to the present. By Alex Frankel*

1378. "Close Encounters" *(Page 24)—the most effective Web sites offer users a conversation, not a monologue. The Main Attraction column by Scott Kirsner*

1379. "Looking Both Ways" *(Page 30)—two views on policies that govern Internet use at work. A Gray Matters column by Wayne D. Bennett and Lori Fena*

1380. "Customer-Colored Glasses" *(Page 36)—as the Web evolves to something with real business value, we revisit some fundamentals. A Customer Interface column by Jim Sterne*

1381. "Where to Begin" *(Page 66)—every intranet project starts somewhere, and the best ones never end. A Power Source column by Tim Horgan*

1382. "Making the Right Choice" *(Page 78)—AT&T's intranet reaches out to touch everyone. A By Redesign column by Debby Young*

OCTOBER 15, 1997

CIO Section 1
Special Report: Project Management

1383. "Project Management: Do or Die" *(Page 24)—many CIOs are overlooking a time bandit with nearly as much destructive potential as the millennium change: the gradual obsolescence of the IT department. An introduction by Christopher Koch*

1384. "Home Field Advantages" *(Page 28)—in the quest for life after outsourcing, CIOs can turn IS departments into valuable project management teams. By Bronwyn Fryer*

1385. "The Big Uneasy" *(Page 40)—enterprise software packages like SAP's R/3 can make or break a project manager's career. For Visio's Neal Myrick, the goal was clear: Deliver a solid computer system, not the moon. By Christopher Koch*

1386. "When Bad Things Happen to Good Projects" *(Page 54)—the warning signs of failure are detectable long before a project falls apart. By Tom Field*

1387. "Project Managers Toolbox" *(Page 64)—here's everything you'll need for keeping track of your project's people, tasks and money. An Emerging Technology column by Curtis F. Franklin Jr.*

1388. "BankBoston's David Iacino" *(Page 76)—a project manager discusses year 2000 project management. A Shop Talk column by Alex Frankel*

CIO Enterprise Section 2

1389. "The Power of Cooperative Thinking" *(Page 34)—effective leadership is no longer a solo activity. Teams can dramatically improve performance at all levels—even at the top. By Abbie Lundberg*

1390. "The PC Price Tag" *(Page 42)—the bad news is desktop costs keep rising. The good news is a spending model called TCO can help control them. By Carol Hildebrand*

1391. "The Elusive Muse" *(Page 50)—ways to build an innovative environment and lure creative people into joining it. By Jennifer Bresnahan*

1392. "Smooth Operators" *(Page 60)—Gillette is regrooming processes and systems to present one cleanshaven face to its global retail customers. By Derek Slater*

1393. "Rewriting the Code" *(Page 66)—proposed revisions to state laws could make your life more difficult. By Jennifer Bresnahan*

1394. "The Hype and the Mighty" *(Page 22)—a charter to cut through the techno-buzz to find what's real. A Reality Bytes column by Lew McCreary*

1395. "Wise Investments" *(Page 28)—what you don't know can hurt your ability to gain—or maintain—competitive advantage. An Intellectual Capitalism column by Richard W. Swanborg Jr. and Paul S. Myers*

1396. "Invisible Technology" *(Page 70)—there's plenty of flashy call center technology to be had. The key is applying it to serve your customers better. A Handshake column by Cheryl Dahle*

1397. "What Is Bandwidth?" *(Page 78)—the skinny on bandwidth. A Learning Curve column by Derek Slater*

NOVEMBER 1, 1997

CIO Section 1

1398. "Relationship Rx" *(Page 40)—the story of Caremark International and Affiliated Computer Services shows that even the most troubled outsourcing partnership can achieve a meeting of the minds. By Peter Fabris*

1399. "Agents of Change" *(Page 50)—in the dog-eat-dog insurance industry, business as usual can mean the end of business. By Bronwyn Fryer*

1400. "Power Steering" *(Page 56)—soon, U.K. consumers will be able to shop freely for electrical power, changing the game for utilities. Just ask Scottish Power. By Malcolm Wheatley*

1401. "Super Users Speed to the Rescue" *(Page 28)—SAP implementations require money, planning and a new breed of user. Here's how those users ensure success. An Executive Counsel column by Danielle Anderson*

1402. "Bringing the Top Brass on Board for Y2K" *(Page 32)—to launch a successful transition, you need to do two things: educate and collaborate. A Year 2000 Challenge column by Scott Kirsner*

1403. "Your Database Is About to Get More Complicated" *(Page 62)—a complicated database is good news if you're looking for ways to store images, audio, video and other Web elements. An Emerging Technology column by Derek Slater*

1404. "Coopers & Lybrand's Ellen Knapp" *(Page 72)—a chief knowledge officer discusses managing knowledge issues. A Shop Talk column by Elaine M. Cummings*

CIO Web Business Section 2

1405. "New Growth" *(Page 36)—at Weyerhaeuser, a carefully tended intranet branches out, hoping to win the hearts of business-minded leaders. By Alex Frankel*

1406. "Special Collections" *(Page 44)—online databases and Web-powered bill collectors help companies track down deadbeats quickly and inexpensively. By Joseph E. Maglitta*

1407. "Insider Trade-Offs" *(Page 51)—Sun's CIO discusses the intranet balancing act: costs, benefits, risks and measuring value in terms of people as well as profits.*

1408. "Making Them Pay" *(Page 20)—while other subscription-only sites publish and perish, BusinessTech earns its keep. A Netrepreneurs column by Anne Stuart*

1409. "For Love and Money"

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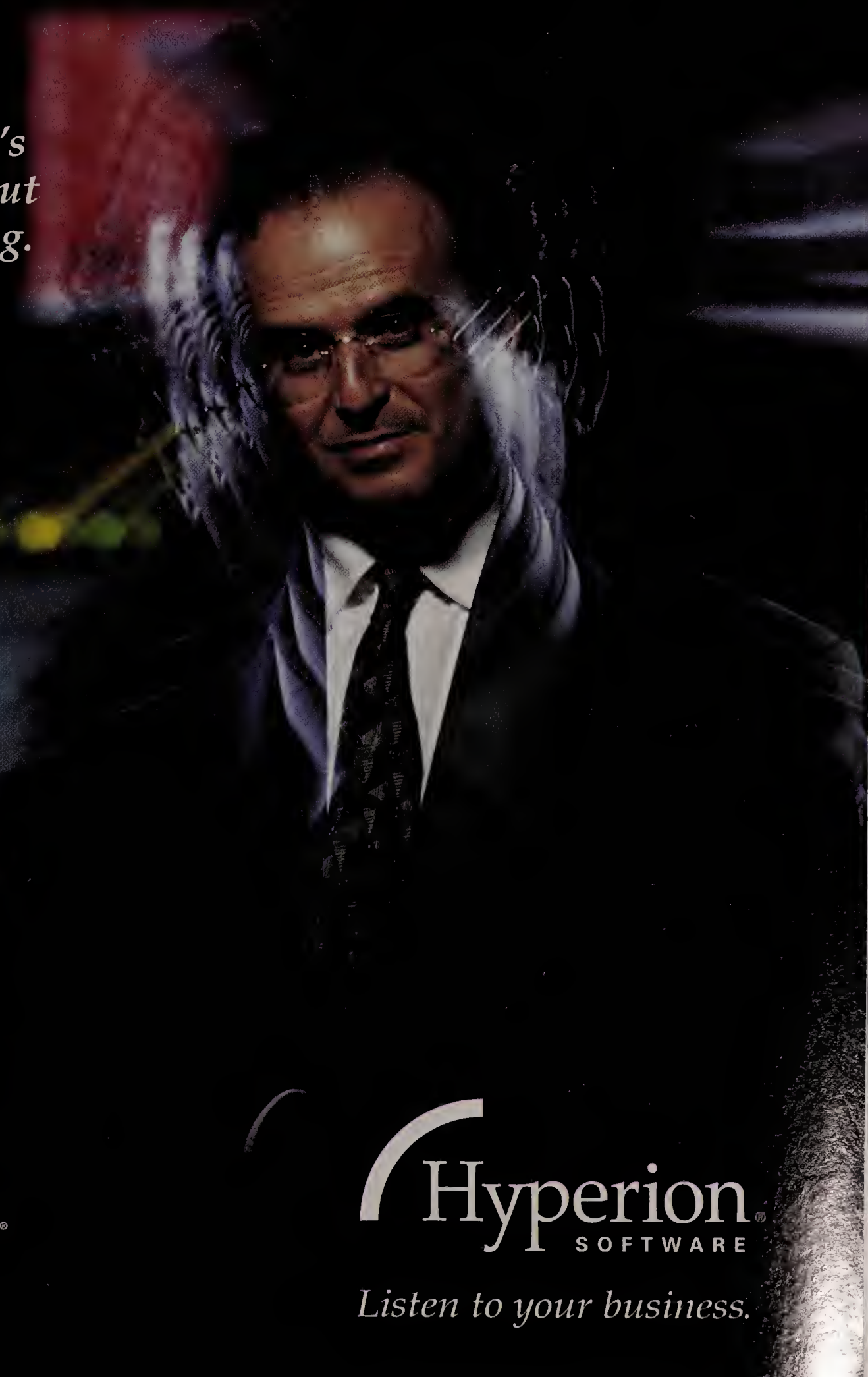

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STORY INDEX

(Page 22)—The Mining Co. strives for pay dirt using the expertise of people who dig all kinds of things. A Netrepreneurs column by Sari Kalin

1410. "Name Calling" *(Page 30)—wrestling over domain names is the latest corporate contact sport. Who will referee? A Gray Matters column by Fred Hapgood*

1411. "The Right Impression" *(Page 56)—advertising online is a lot like advertising elsewhere: It's easy to do poorly and hard to do well. A few tips on the latter. A Customer Interface column by Jim Sterne*

1412. "Seek and Ye Shall Find" *(Page 60)—getting the information you need on the Web doesn't necessarily have to be a headache. A Power Source column by Mike Carifio*

1413. "The Road to Interactivity" *(Page 70)—BMW establishes more than presence on the Web. A By Redesign column by Ruth Greenberg*

NOVEMBER 15, 1997

CIO Section 1

1414. "Five Uneasy Pieces, Part 3" *(Page 34)—co-opetition, enterprise resource planning software, IT/business alignment, secure electronic commerce and push technology should be approached with a healthy dose of common sense. By the Editorial Staff*

1415. "Web Cops" *(Page 50)—policing employees' Web access may be distasteful, but laying down the law may pay dividends. By Tom Field*

1416. "Group Efforts" *(Page 60)—in the ever-changing world of IT, CIOs find a roundtable of their peers is the best place to get both information and advice. By Mindy Blodgett*

1417. "Off-Road Access" *(Page 26)—to provide Web access to data warehouses, you'll have to explore the terrain beyond the beaten track. A Meta View column by Aaron Zornes*

1418. "Storage Starts to Sizzle" *(Page 68)—the proliferation of data has many an IS department scrambling for greater capacity. An Emerging Technology column by Derek Slater*

1419. "Texas Health Resources" *(Page 80)—through an automated program, one state's health-care organization reduced the time and cost involved in matching job candidates to open positions. A Working Smart column by Debby Young*

CIO Enterprise Section 2

1420. "Speed!" *(Page 38)—chasing the record for speed is part of the culture at Honda of America. It also happens to make good business sense. By Jennifer Bresnahan*

1421. "Is Benchmarking Worth the Bother?" *(Page 48)—definitely. It won't reinvent your company, but it will show you how to improve bit by bit. By Derek Slater*

1422. "Anatomy of a Failure" *(Page 54)—the inside story of a fatally flawed data warehouse project. By Lauren Gibbons Paul*

1423. "Survival of the Fastest" *(Page 62)—have you scrutinized your business model lately? Unless you can anticipate shifts in customer values, you're destined to become obsolete. By Carol Hildebrand*

1424. "Happy Days 2000" *(Page 28)—problem? What problem? A Reality Bytes column by Derek Slater*

1425. "The Knowledge Biz" *(Page 32)—a review of the menu of software and services heating up the knowledge management kitchen. An Intellectual Capitalism column by Tom Davenport*

1426. "Everything Is Measurable" *(Page 68)—returns on technology investments should be far from fuzzy. If benefits can be observed, they can be counted. A Checks & Balances column by Douglas Hubbard*

1427. "Wary of Groupware?" *(Page 74)—proponents of groupware believe it encourages collaboration and provides a framework for teamwork. A Learning Curve column by Derek Slater*

DECEMBER 1, 1997

CIO Section 1

1428. "Eye Opener" *(Page 38)—CIOs, bent on wringing operational efficiencies from their IT investments, may have become oblivious to the side effects of their success. An interview by David Pearson*

1429. "Crossing No Man's Land" *(Page 44)—successfully smuggling information across the no man's land between enterprise software packages can have more bottom-line impact than the applications. By Christopher Koch*

1430. "Get the Right People On Board" *(Page 58)—your year 2000 project is unlike any other IT undertaking. You can't move the deadline, you're in the spotlight and everyone else is racing to fix their systems at the same time. By Scott Kirsner*

1431. "The Year in Review" *(Page 70)—An index of all major articles published in CIO in 1997, including a cross-reference by article type.*

1432. "Not-So-Secret Agenda" *(Page 32)—successful meetings require planning, practice and plain English. An Executive Counsel column by Eric Torbenson*

1433. "Network Computers" *(Page 84)—the skinny on the thin client revolution. An Emerging Technology column by Paula Jacobs*

1434. "Iowa's Public Defender's Office" *(Page 96)—An automated payment and data collection system reduces data entry by 60 percent. A Working Smart column by Ruth Greenberg*

CIO Web Business Section 2

1435. "Joining Forces" *(Page 42)—at the U.S. Atlantic Command, a ground-breaking intranet gives everyone access to the same cutting-edge information. By Jay Finegan*

1436. "Local Color" *(Page 56)—how to host a Web site in cultures you don't know. By Lynda Radosevich*

1437. "Funky Music" *(Page 68)—this year, music fans don't have to go to a record store to buy a CD. Next year, they won't have to buy a CD. By Peter Fabris*

1438. "Sound Without Fury" *(Page 30)—Liquid Audio's Web-enabled music distribution is designed to quiet music industry fears. A Netrepreneurs column by Art Jahnke*

1439. "A Very Public Affair" *(Page 34)—in Web commerce, traditional assumptions about privacy are rapidly becoming old-fashioned notions—but there are some limits. A Gray Matters column by Wayne D. Bennett*

1440. "Stacking the Deck" *(Page 36)—as Web searching grows ever-more complicated, winning the search-engine game requires keeping a few tricks up your sleeve. A Customer Interface column by Jim Sterne*

1441. "Community Theater" *(Page 38)—can corporate players be convincing—or successful—in the communitarian role? The Main Attraction column by Scott Kirsner*

1442. "Winning Moves" *(Page 80)—as you build your Web site, make sure your users don't become pawns of unsophisticated search techniques. A Power Source column by Mike Carifio*

1443. "Home Improvement" *(Page 94)—Epson's redesigned intranet gives visitors more details about what's on the site and how to find it easily. A By Redesign column by Anne Stuart*

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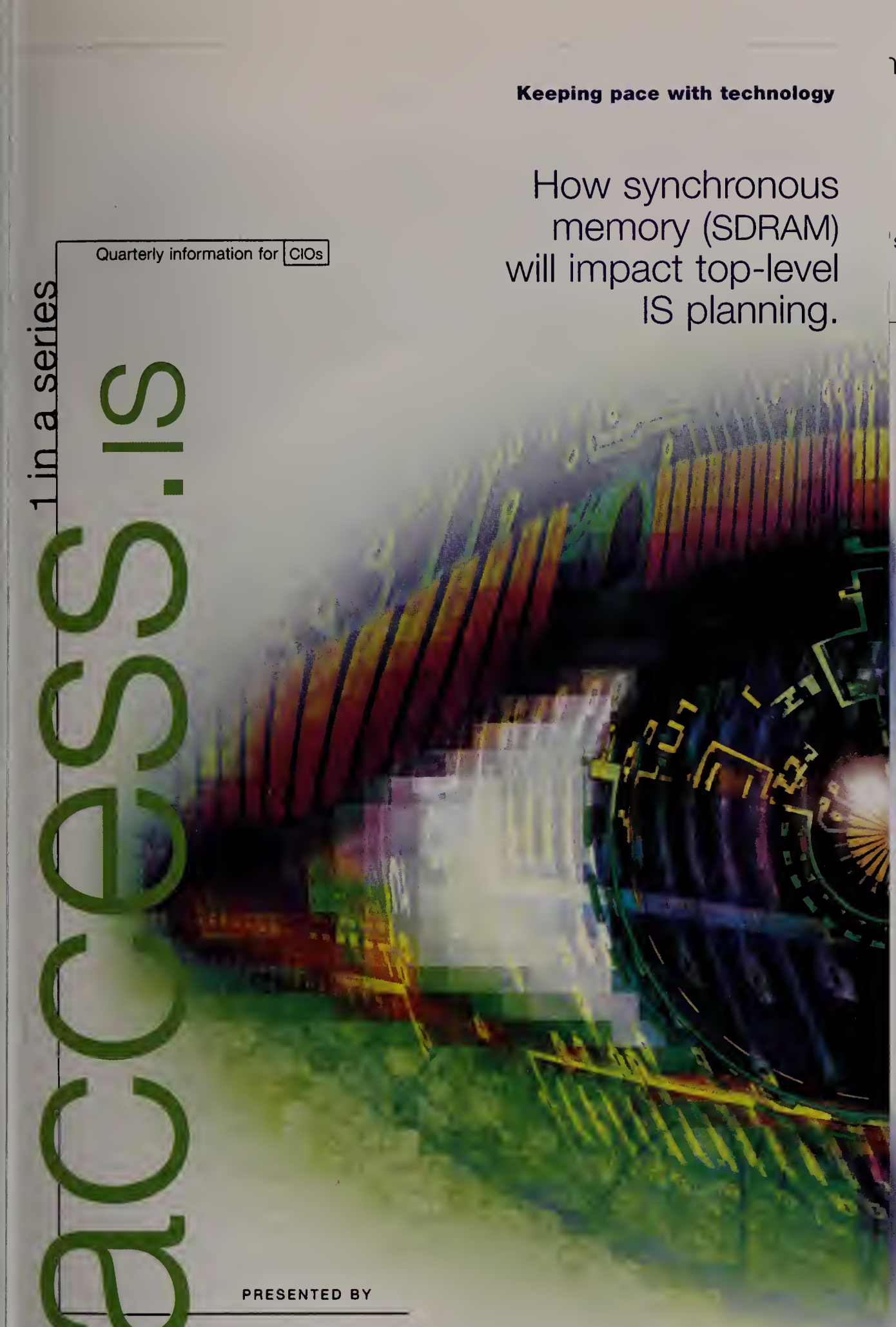

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Emerging Technology

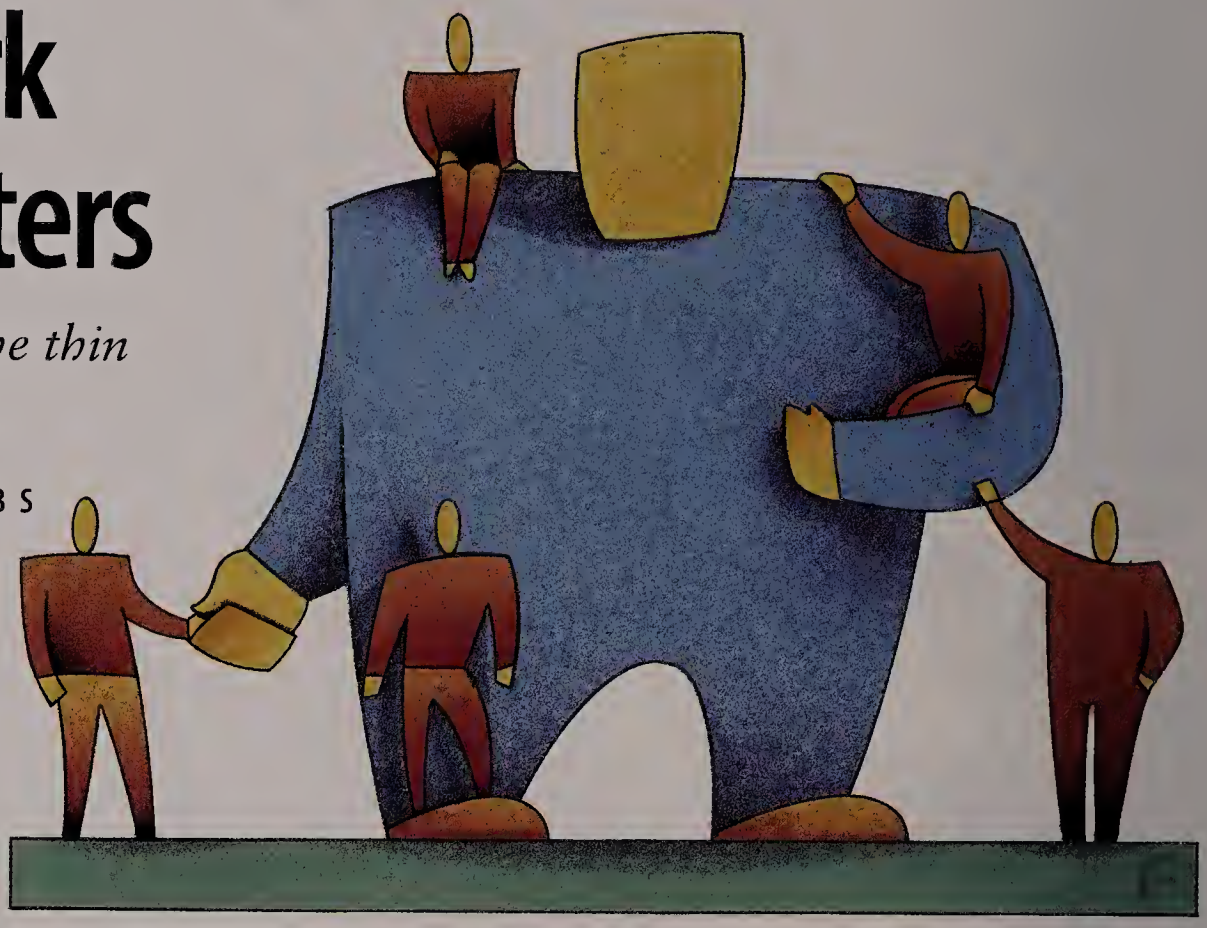
THE STATE OF THE ART, NEW PRODUCTS AND STAYING AHEAD OF THE CURVE

Edited by Elaine M. Cummings

Network Computers

The skinny on the thin client revolution

BY PAULA JACOBS



IT HASN'T BEEN EASY to tune out the hubbub about network computers. Offered by at least a dozen vendors, each NC is slightly different from the next, and it's hard to figure out which suits your company's needs. Never mind that they were announced prematurely and may not offer the whopping cost savings they initially promised.

So while the so-called NCs have yet to ignite customers' desires, they're already causing sparks to fly among vendors. Some vendors are entering the hardware market for the first time (Oracle Corp.) while others are reconfiguring product lines to be a part of the wildfire (IBM Corp., Network Computing Devices Inc., Wyse Technology Inc.). The trouble is, while network computers may bring some value to the IS department's bottom line, the offshoot of marketing blather is more heat than light.

Smoking out the truth presents an opportunity, though. "All those vendor wars are bringing out cheaper products that meet customer needs," says Eileen O'Brien, director of the enterprise NC program at International Data Corp. (IDC) in Framingham, Mass., which is a sister company to CIO Communications Inc. "In the end, the big winners will be CIOs."

To help you come out as one of those winners, we've identified who's doing what, where their biases lie, and how and where they use network computers. We've also cut through the techno-speak to present the benefits you'll derive from network computers and differentiated where individual vendors fall in the vast spectrum between dumb terminals and desktop PCs.

IN THIS SECTION

Smart Cards

Desktop Video

Online Learning

Web Deployment System

What All NCs Do

The confusion over network computers masks a simple goal: to interweave the power of a desktop device with the simplified management of a central host. Nobody wants to return to the days of dumb terminals, but many want to eliminate the nightmares of multiple desktop configurations and unsecured floppy drives.

In general, network computers simplify the desktop configuration by eliminating hard drives or floppy drives and making it possible to roll out new applications without upgrading the desktop. "The NC is not a stripped-down PC, but it's more than a dumb terminal," says Jeffery Menz, director of product marketing at Redwood Shores, Calif.-based Network Computer Inc. (NCI), the Oracle subsidiary charged with building network computers.

Network computers provide users with a simple, consistent interface to access new applications and allow IT professionals to manage resources more easily. "[NCs] are a convergence of multiple technologies in client, network and software spaces," explains Bret Sommers, strategic Internet technologist for Cambridge Technology Partners Inc., a systems integration and consulting firm

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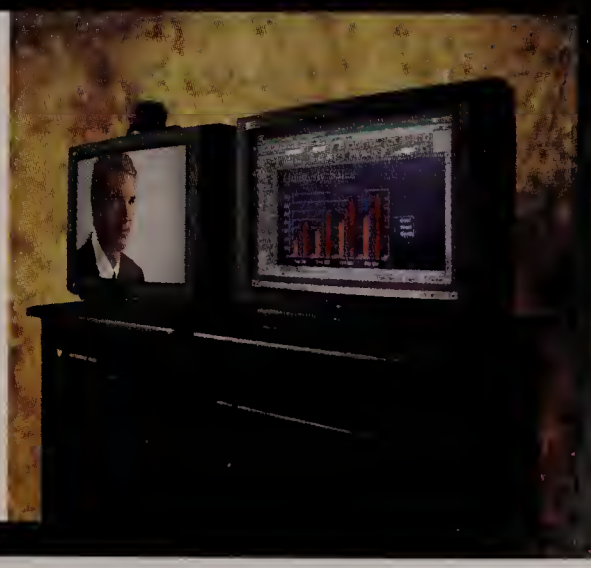


based in Cambridge, Mass. As such, the complexity of PC administration shifts to the network and the server, but even so, those arenas fall under the IS department's control.

But because NCs primarily shift costs rather than eliminate them, they're not going to replace PCs any time soon. IDC's O'Brien estimates that this year, only a half-million network computers (two-thirds without hard disks, one-third with) will be newly deployed worldwide, compared with 80 million PCs shipped. In 2001, the NC deployment number will be about 10 million, whereas PC shipments will reach 92 million units.

Where NCs Really Differ

The big difference in network computers is in software, and the issue for CIOs is whether users will be running Java applets, Windows applications, legacy programs or some combination thereof. In this regard, network computers fall into three corresponding categories:

Java applications. The progenitors of the network computer revolution, thin-client network computers, did not ship until a few months ago, although vendors had promised them more than a year ago. These machines, including IBM's Network Station Series 1000, Sun Microsystems Inc.'s JavaStation and NCI's NC Access, run Java applets within a browser or software called a Java "virtual machine."

The value to Java is that its applets are small and theoretically portable. The jury is still out, however, on whether you can actually write one Java applet and run it anywhere without experiencing compatibility problems.

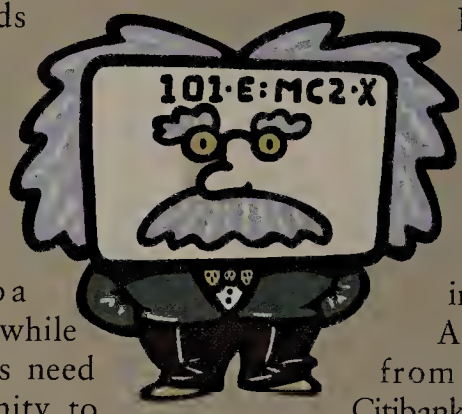
Nonetheless, Sun envisions Java enabling corporations to extend applications to suppliers and other partners, which can then use a Web browser to access inventory and other enterprise applications, says Steve Tirado, director of product marketing for Java systems at Sun Microsystems in Palo Alto, Calif. For example, The Sabre Group Holdings Inc., the Fort Worth, Texas-based technology division of American Airlines Inc., is prototyping a Java version of its Qik-Access software for thin clients in

Countertop Intelligence

No more fumbling for that last coin in your pocket. Your credit card is about to get smarter.

RARELY DOES THE UNITED STATES seem like a developing nation, especially in the area of technology. But when it comes to smart cards, the country is still a giant leap behind some of its European and Asian neighbors.

Smart cards—devices the size of credit cards with an embedded chip that holds various types of information or value in electronic form—offer both convenience and security. Because the encryption is tougher to crack than a magnetic stripe, smart cards are an effective weapon against payment fraud and counterfeit money. "Contact" type smart cards require insertion into a smart card reader, while "contactless" ones need only close proximity to readers to transmit information from an embedded antenna.



As early as 1980, companies such as France Télécom were implementing prepaid smart phone cards to minimize the need for operators and thus reduce telecom costs. When users inserted the cards into the phone, the cost of the call would be deducted and the remaining balance would be displayed on the reader. Today in Singapore, the CashCard acts as an electronic purse that replaces money for movies, parking, gas and fast food restaurants. Smart cards can also be used in banking, health care and transportation and other applications where one might find coin-operated machines, such as tollbooths and vending machines.

If you haven't seen these cards yet, you will. Currently, about 80 countries use smart cards in pay phones, and according to Cliff Condon, senior analyst at Forrester Research Inc. in Cambridge, Mass., the world market for these cards is expected to grow to more than $1 billion by 2000.

The cards failed to take off initially in the United States because telecom costs were already the lowest in the world. However, starting in 1996, more than 40,000 students, faculty and staff at Florida State University in Tallahassee began carrying smart cards that function as a student ID as well as an electronic purse for vending machines, laundry and bookstores.

SMART CARDS

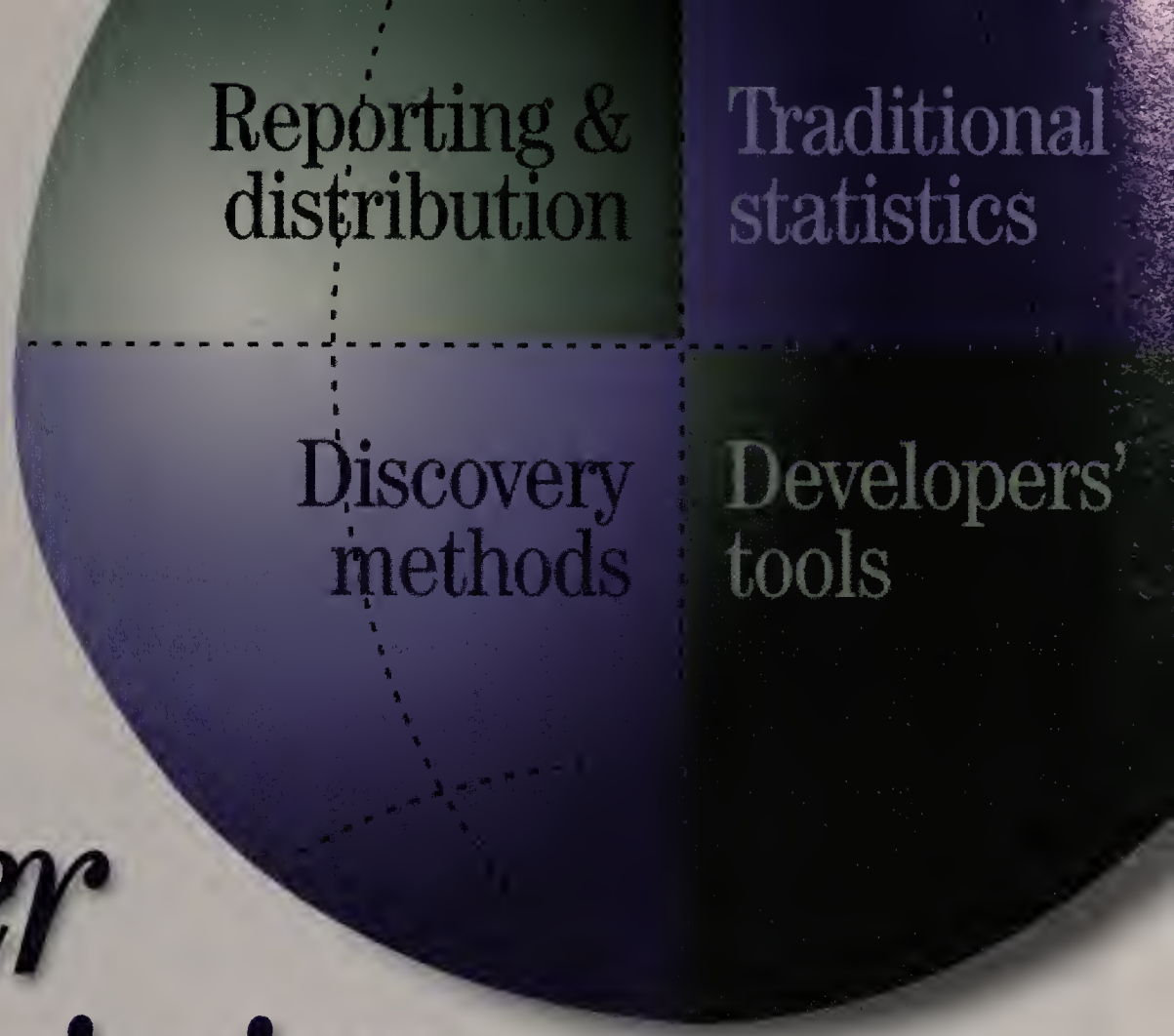
Eventually, students will even have electronic access to their grades, says Bill Norwood, vice president of new business development for CyberMark LLC in Columbus, Ohio.

And interest is moving from campuses to cities. Citibank NA, Chase Manhattan Corp., MasterCard International Inc. and Visa International Service Association have joined forces to create a pilot, called the New York Smart Card Program, that provides smart cards to customers and smart card terminals to roughly 700 selected merchants in the city's Upper West Side.

In October, Gemplus Corp. in Montgomeryville, Pa., announced the availability of GemXpresso, the first Java-based smart card with a 32-bit RISC processor, giving it the horsepower to run multiple large, complex applications on a single card. Prior to GemXpresso, the most advanced smart card was limited to an 8-bit microprocessor. "The technology gives credit card issuers and application developers the ability to use a single tool to 'write once, run anywhere,'" says François Dutray, group executive vice president of Visa International in Paris. Information about Gemplus's products and services can be found on the Web at *www.gemplus.com.*

–Elaine M. Cummings

ILLUSTRATION BY MARK FISHER



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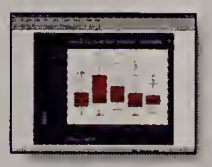

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Emerging Technology

the hospitality industry.

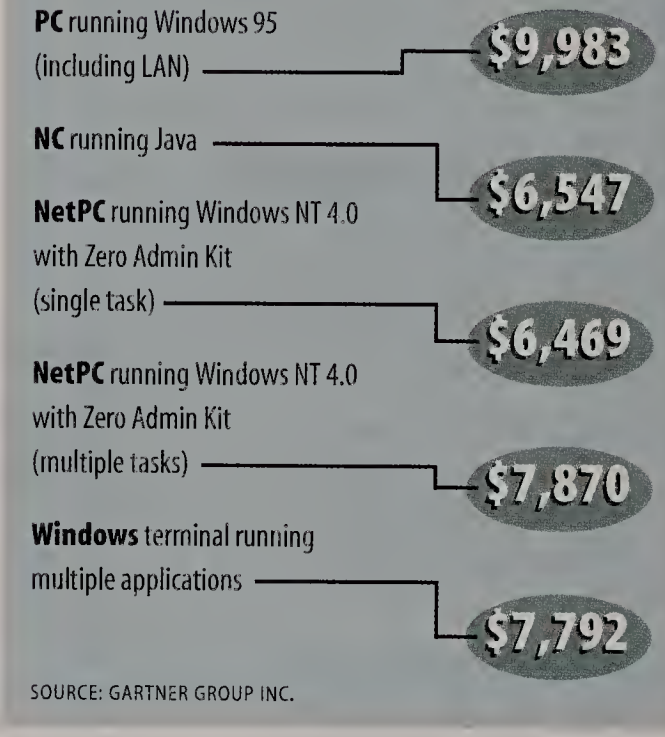
However, Tirado does not recommend replacing PCs immediately, citing a shortage of Java applications. "Java is still maturing [in terms of] functionality and performance," he says. "We see the NC as a replacement terminal to introduce new applications at the terminal."

Windows applications. As one might expect, network computers running Windows are being promulgated by the Intel-Microsoft contingent and are known as NetPCs or Windows-based terminals.

Cost of Ownership: PC versus NC

(per user per year)

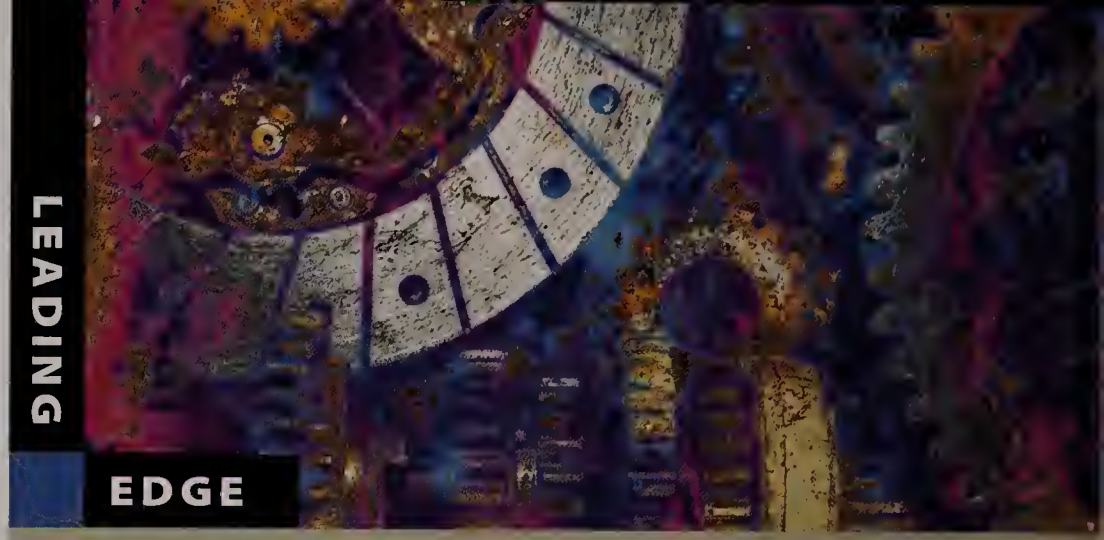
Guess what? They're not that different.



SOURCE: GARTNER GROUP INC.

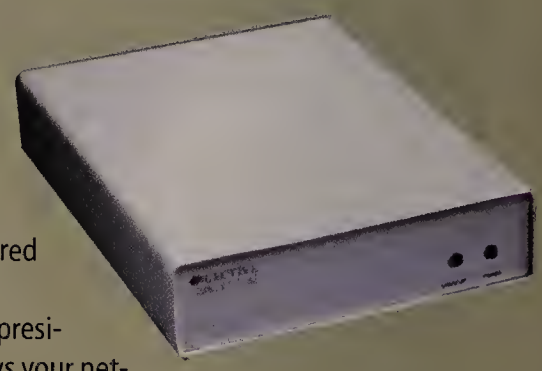
The difference between the two is that the former are equipped with hard drives, but not floppy or CD drives. They increase security, reduce the risk of viruses or other applications being introduced onto the hard drive and centralize management. Windows-based terminals, on the other hand, don't have hard drives. Both, however, assume the presence of a server running Windows NT 5.0 as part of Microsoft Corp.'s so-called Hydra Windows multiuser system (if you remember your Greek mythology, you know that the hydra had one body and many heads).

This strategy addresses the needs of organizations with mobile workers who need remote dial-in access to applications running on centrally managed servers, says John Frederiksen, Microsoft's group product manager for Hydra. He adds that



Strike Up the Bandwidth

DO YOU WANT TO UNLEASH desktop video within your organization but are afraid the additional network traffic will bring your LANs to their knees? **VidModem** by Objective Communications Inc. in Portsmouth, N.H., makes it possible to roll out broadcast-quality, two-way desktop video over regular telephone wires, bypassing data networks altogether. The technology incorporates an analog FM signal processor that delivers high-quality video and CD-quality stereo audio to the desktop.



"All other video communications vendors are attempting to move large packets of video and data along computer networks or trying to make use of a so-called 'unused' pair required for future LAN use," says Steven Rogers, Objective's founder and president. "That approach either slows your network to a crawl or, at the very least, forces you to rewire. Our goal was to create a technology that takes advantage of the underutilized network already in place: the twisted-pair wire that the telephone uses."

VidModem distributes video signals from Coax, DSS or other satellite connections and provides videoconferencing capability via ISDN or ATM to the desktop or to conference rooms.

For more information, call 603 334-6700 or visit *www.objectivecom.com.*

Teacher's Pet

ONLINE LEARNING IS ONE of the most compelling uses of the Internet. Being able to take any course offered anywhere from the comfort of one's own office or home has obvious benefits. But how does an instructor run a real-time class virtually? How do you raise your hand in a virtual classroom?

Interactive Learning International Corp. (ILINC) in Troy, N.Y., has the answers. The company's **LearnLinc Pro-Net** is a set of tools that allows instructors and corporate trainers to synchronize class participation via desktop video and to present content so that all students view and discuss the same document simultaneously. Multimedia and Web-based content is controlled via the Internet, and video interaction is facilitated through an ISDN connection. Audioconferencing and videoconferencing functionality are not included in the package and must be arranged separately.

The product includes a virtual hand-raising function, a shared whiteboard for class interactions, a question-and-answer application and a text chat provision. If a student is having difficulty grasping a concept, the software allows the instructor to take a look at the student's PC screen to offer assistance. It also gives instructors administrative tools to assign access privileges to certain files and sites and manage multimedia resources. For more information, call 518 283-8799 or visit *www.ilinc.com.*

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these systems work well as department store kiosks, where customers can fill out orders online, or in hotel rooms, where guests can access travel information.

Legacy applications and more. Perhaps the most common network computer grew out of X terminals (so called because they used a platform-independent communications protocol called X). Not surprisingly, vendors of these devices—including Network Computing Devices, IBM, Hewlett-Packard Co. and Wyse Technology—have evolved their X terminal product lines to participate in the NC bandwagon. According to vendors, these NCs fit well in environments where users need access to a combination of Windows, database, legacy and even Java applications, and where centralized management, control and security are important. The typical user is performing task-oriented production work, such as insurance claims processing, airline reservations, call centers and order entry.

Bill Homa, CIO of Hannaford Brothers Co., a retail grocery chain in Scarborough, Maine, has implemented IBM's Network Station NCs in corporate headquarters as replacements for low-end PCs and dumb terminals. He estimates the Network Stations have reduced the total cost of ownership by up to 50 percent, while enabling the company to extend its network to employees who did not previously have access to e-mail and corporate information.

"It functions like a thin client," says Homa. "We like that it's diskless and small, and we don't need to worry about theft, backup or viruses." In his eyes, NCs are perfect for the retail environment or for dumb-terminal users who need access to the Web, an intranet or Lotus Notes.

Where They Fit in Your Organization

How should you factor an NC into your strategic plans? That depends, says Cambridge Technology's Sommers. It's important to determine when NCs are appropriate and to choose opportunities that fit well into network computing. He cites industries where there are broad audiences without PCs, such as retail, which employs point-of-sale (POS) terminals.

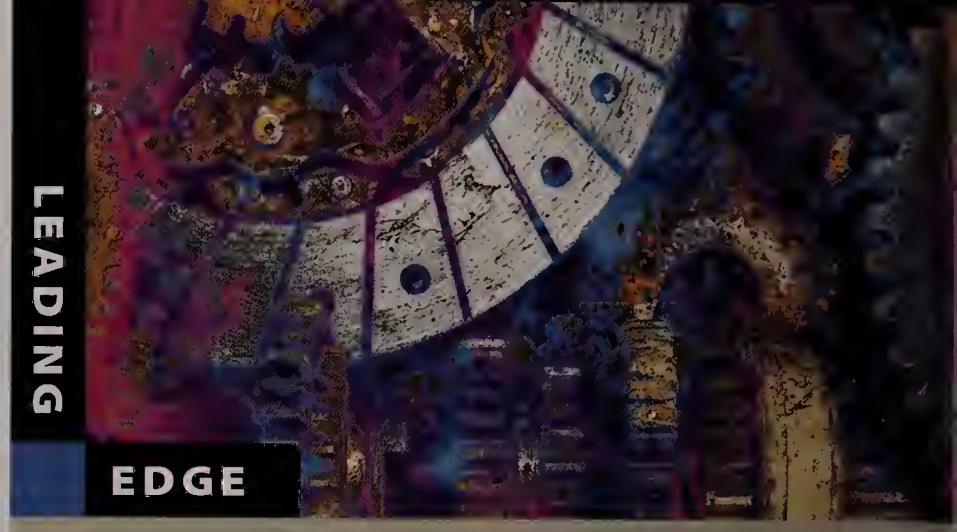
Another strategy might be to deploy localized applications on network computers in small workgroups to diminish risks or to target less sophisticated users (power users might resist swapping their PCs). "Dropping in an NC that is easier to use and involves less administration can be a win-win in this environment," says Sommers. "Choose people who complain of IT understaffing, where trouble-shooting takes weeks or days to resolve on PCs. In this environment, the NC will reduce stress."

At the same time, one must be aware of a network computer's drawbacks. There has been a lot of hype about a low cost of ownership, but hard evidence of savings and case studies based on large enterprise deployments are still scarce. Implementing NCs will require beefing up your network infrastructure—both bandwidth and servers. "At its highest level, network computing puts greater importance on the network," notes Theo Forbath, senior consultant at Northeast Consulting Resources Inc. in Boston, citing the bulk of Microsoft Office as just one consideration. "Companies that are considering this need to consider running fiber to the network backbone and building redundant backbones."

Finally, NCs are still relatively immature in terms of software, notes Tom Austin, a vice president and research director at Gartner Group Inc. in Stamford, Conn., who oversees the electronic workplace technologies and network computing services. His prediction for when network computer software will be mature, robust and broadly available: no sooner than the middle of 1999.

"The risks are plenty," emphasizes Sommers. "Implementing hardware solutions that fail is generally more risky than implementing software solutions that fail. IT managers are afraid to recommend a hardware solution that fails, but a software application that fails just goes away. Having gravestones around is not a good way to secure your job." CIO

Paula Jacobs, a freelance writer in Framingham, Mass., can be reached at pjacobs@world.std.com.



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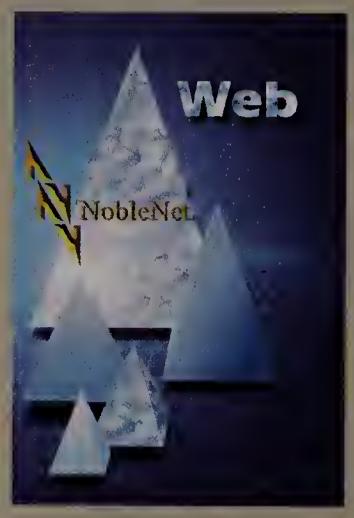

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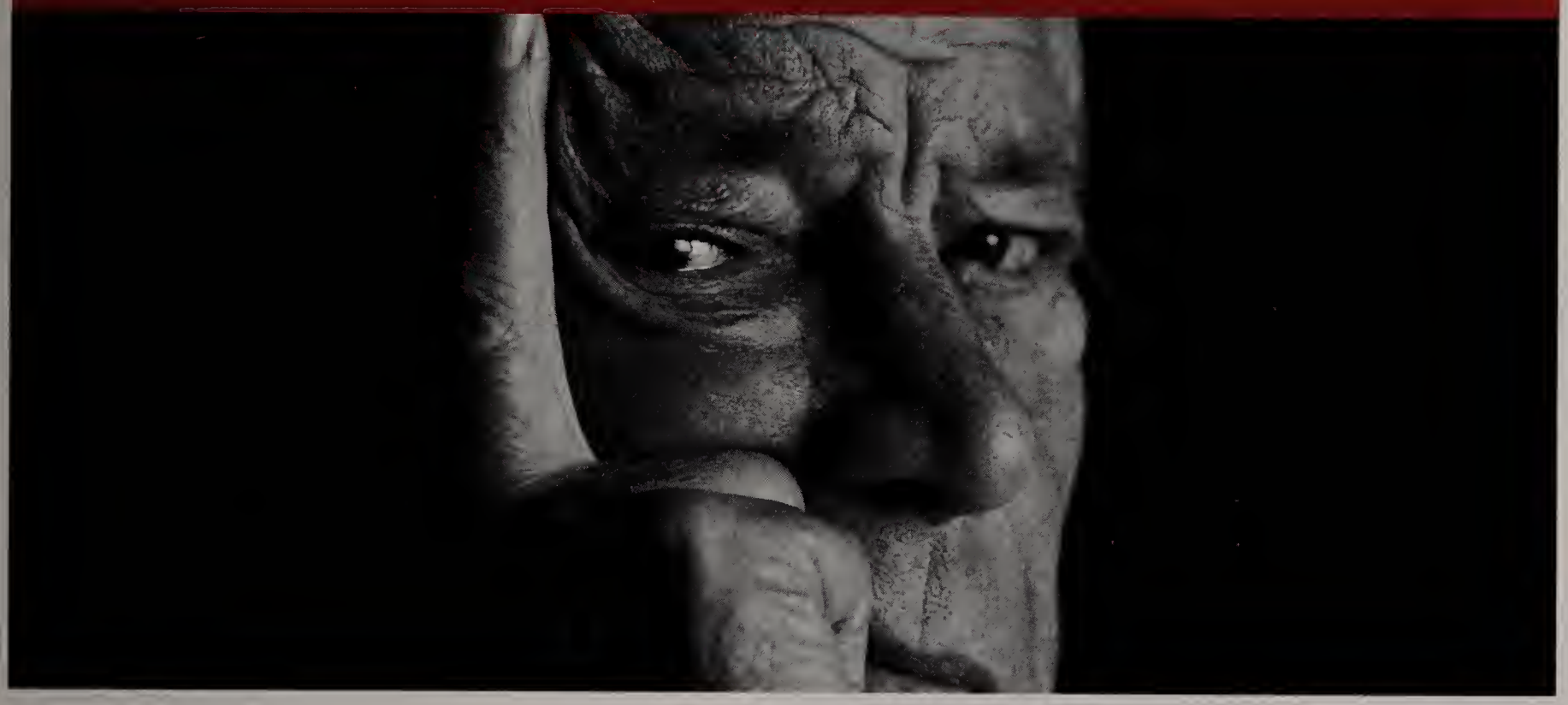

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INDEX

Page numbers refer to the first page of the article(s) in which the company is mentioned. This index is provided as a service to readers. The publisher does not assume any liability for errors or omissions.

Company Index

American Airlines Inc. 58, 84
Andersen Consulting 20
Baan Co., The 44
Booz, Allen & Hamilton Inc. 58
Cambridge Technology Partners Inc. 84
Chase Manhattan Corp. 84
Cisco Systems Inc. 20
Citibank NA 84
Comdisco Inc. 58
Compaq Computer Corp. 96
Computer Associates International Inc. 58
Cybercalifragilistic Gifts 20
CyberMark LLC 84
de Jager & Co. Ltd. 58
DuPont Co. 20
E.G. Mahler and Associates Inc. 20
Equifax Inc. 58
FileNet Corp. 96
Fleet Financial Group 58
Forrester Research Inc. 44, 84
France Télécom 84
Gartner Group Inc. 44, 58, 84
GE Information Services 58
Gemplus Corp. 84
GeoNet Communications Inc. 20
Gordon & Glickson PC 58
Halbrecht Lieberman Associates Inc. 32
Hannaford Brothers Co. 84
Hewlett-Packard Co. 44
IBM Corp. 20, ...84
Ingram Micro Inc. 20
Intel Corp. 12, 32
Interactive Learning International Corp. 84
International Data Corp. 84
Intrusion Detection Inc. 20
Kaspia Systems Inc. 20
Kellogg Co. 44
Kmart Corp. 20
Kurt Salmon Associates Inc. 44
MasterCard International Inc. 84
Microsoft Corp. 84, 96
Nabisco Inc. 44
Netscape Communications Corp. 20
Network Computer Inc. 84
Network Computing Devices Inc. 84
NobleNet Inc. 84
Northeast Consulting Resources Inc. 84
Numetrix Laboratories Ltd. 44
Objective Communications Inc. 84
Oracle Corp. 44, 84
PeopleSoft Inc. 32, 44
Port Authority of New York and New Jersey, The 32
Price Waterhouse LLP 58
Red Pepper Software Co. 44
Reebok International Ltd. 44
Sabre Group Holdings Inc., The 58, 84
SAP AG 32
SAP America Inc. 44
ServiceMaster Co., The 12
Starbucks Coffee Co. 32
Strattman Design 20
Sun Microsystems Inc. 20, 84
Symmetrix Inc. 32
Thinking Machines Corp. 20
VF Corp. 44
Viacom Inc. 32
Visa International Service Association 84
Wyse Technology Inc. 84

Advertiser Index

**Denotes Section 2 Advertisers*

3COM Corp. 63
Acer America 77*
Acxiom Corp. 19*
ADP Inc. 61
Amdahl Corp. 41
American Power Conversion 63*
AMP Inc. 13
Apex PC Solutions 81*
Applied Theory 85*
Arbor Software 75
Assoc. of Imaging and Information Mgmt. 89*
AT&T Corp. 33*
Bluestone Inc. C3*
CAP Gemini America 6*
Ciber Consulting Inc. 9
CIO Communications Inc. 31*, 43, 87*, 93, 95, 96A, 70A*
Cisco Systems Inc. 13*
Compaq Computer Corp. 6
Computer Associates Intl. Inc. C2*, 5, 15*
Dell Computer Corp. C2, 28*
Deltek Systems 83*
Eastman Kodak Co. C3
EMC Corp. 71*
Exabyte Corp. 17
Gateway 2000 Inc. 10
GTE Corp. 54*, 65
Hewlett-Packard Co. 24
Hyperion Software 79
IBM Corp. 35*, 37*, 39*, 59*, 82
Inference Corp. 89
Intel Corp. 41*
Intergraph Corp. C4*
LBMS Inc. 27*
Lexmark Corp. 67
Lotus Development Corp. 35, 45*
Lucent Technologies Inc. 27, 60*
Manugistics Inc. 53
MCI Communications Corp. 15
Mercury Interactive 53*
Microcom Inc. 68
MKS Inc. 65*
Motorola Inc. 55
NCR Corp. 48
Net-It Software Corp. 49*
Nortel 75*
Novell Inc. 16*, 18
Oracle Corp. 5*
PeopleSoft Inc. 30
Peritus Software Services Inc. 91
Quantum Corp. 22*
Samsung 78*
SAP America Inc. 2
SAS Institute Inc. 23, 25*
Sequent Computer Systems Inc. 33
Siebel Systems 77
Silicon Graphics Inc. ....C2 Flap*, 10
Spectrum 91*
Sprint (Regional) 43, 51*
SPSS Inc. 87
Storage Technology Corp. 30A*
Sun Microsystems Inc. 21*
Sybase Inc. 73
Tandem Computers Inc. 66*
Tektronix Inc. 73*
Tivoli Systems Inc. C4
US West (Regional) 87*
UUNET Technologies Inc. 9*, 21
VisionTek 80A, 81
Vtel Corp. 85
Walker Inc. 51
WilTel 2*
Xerox Corp. 56
XLConnect 93*

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Working Smart

MAXIMIZING THE PAYOFF FROM I.T.

Iowa's Automated Payment and Data Collection System

Vital Statistics:

- **Organization:** Iowa State Public Defender's Office, Des Moines
- **Application:** Automated payment and data collection system
- **Technologies:** Compaq Computer Corp. server running Microsoft Corp. Windows NT and FileNet Corp.'s Watermark document imaging software; Microsoft Access database
- **Scope:** Three accounting technicians
- **Sponsor:** Michael Adams, accounting technician
- **Objective:** To enable technicians to process payments for the services of court-appointed and contract attorneys faster and track claims from invoice through payment
- **Payoff:** Eliminated the need to hire additional staff in the face of growing workload; reduced time spent on data entry by 60 percent

ACCOUNTING TECHNICIANS at the Iowa Department of Inspections and Appeals Fiscal Services Bureau—the accounting arm of the state's public defender's office—can't hope to control crime or balance the scales of justice by themselves. But they can grease the wheels a bit by making sure court-appointed and contract attorneys get paid on time. Last year, the office implemented document imaging and data warehousing technology to facilitate timely and accurate payments. Now the office's accounting technicians have the tools to keep pace with a workload expected to grow.

The public defender's office pays court-appointed and contract attorneys who provide legal representation and other services for indigent clients. It handled approximately 35,000 cases during the 1997 fiscal year, along with about 100 additional claims for services generated by the cases, such as research assistance, translations and court reporting, amounting to approximately $16.4 million paid out. The number of claims has more than doubled in the past five fiscal years; 1997 saw a 25 percent gain in claims over the previous year. Despite the increase, the task of processing payments still falls to Accounting Technician Michael Adams and two other staff members.

A few years ago, the office relied solely on manual processes to pay claims and mail checks to the hundreds of people who provided services. As the number of claims increased, however, the accounting team couldn't keep up. It was not unheard of for lawyers to get paid late or to receive duplicate payments for the same service. The volume of claims threatened to swamp Adams's department, so he began to explore ways to streamline the process. After consulting his colleagues, he found a way to move the whole process online.

In 1996, the office implemented an automated payment and data collection system to speed check processing and reduce errors.

With the automated system, a technician scans images of court documents and claims and stores them in a Microsoft Access database. Document scanning has slashed the time spent on data entry by 60 percent. In addition, any staff member can open a file from his or her workstation, check the image for accuracy and send a payment. Images are conveniently stored on CDs for future reference.

Before the system's implementation, the process of addressing doubts about a claim required a time-consuming trip to the state archives. Now any question about a claim can be quickly answered by calling up an onscreen image of the claim. According to state officials, the average turnaround time for retrieving historical claim information has been slashed from three weeks to a few minutes. As a result of streamlining records management, customer service and efficiency have improved, says Adams. Best of all, the gains have been achieved without hiring additional members to the accounting staff.

The database also provides a storehouse for specific information, such as who the clients are, what they were charged with, which attorneys defended them and how much cases cost.

Adams says he's already been approached by members of the state legislature who want to use the data to get a better handle on the cost of specific crimes. The database can help Adams see how much it costs to defend someone against a charge of grand theft auto or what effect stiffer sentences might have on attorneys' fees. He can also pinpoint who the most expensive lawyers are—or the cheapest. "In the past, we tracked only the payment per county and attorney," he says. "Now we can query the database for [costs] by type of crime, by client or even by the code section of Iowa state law." That sort of well-organized data may help legislators find out what the most costly crimes are and how best to deter them, Adams says.

–Ruth Greenberg

Send Working Smart ideas to Associate Editor Megan Santosus at santosus@cio.com.

CIO

PERSPECTIVES

Keynote Presenter

Tom Peters

April 26-29, 1998
Hyatt Grand Cypress
Orlando, Florida

The Powerful IT Organization:

Forging Customer, People and Business Partnerships

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April 26-29, 1998

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Yes, I'd like to participate in the golf tournament on Sunday, April 26 at 11 a.m.
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Casual! Please, no suits, ties or business attire!

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A block of rooms has been reserved at the Hyatt Grand Cypress. We urge you to make your reservations early by calling the hotel at 407 239-1234. Be sure to identify yourself as part of the **CIO** *conference to receive the conference rate. Make your reservations early and guarantee your room with a credit card, as all unreserved or unguaranteed rooms will be released on March 27, 1998. Hotel reservations, cancellations and charges are your responsibility.* **CIO** *will make hotel reservations for government/military participants only.*

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CANCELLATION

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You may cancel your enrollment up to March 27, 1998 without penalty. A $250 administration fee will be imposed for cancellations between March 28-April 10. ***No refund or credit will be given for cancellations received after April 10, 1998 or for no shows.*** *You may send a substitute in your place.* **CIO** *reserves the right to decline enrollment to any registrant.*

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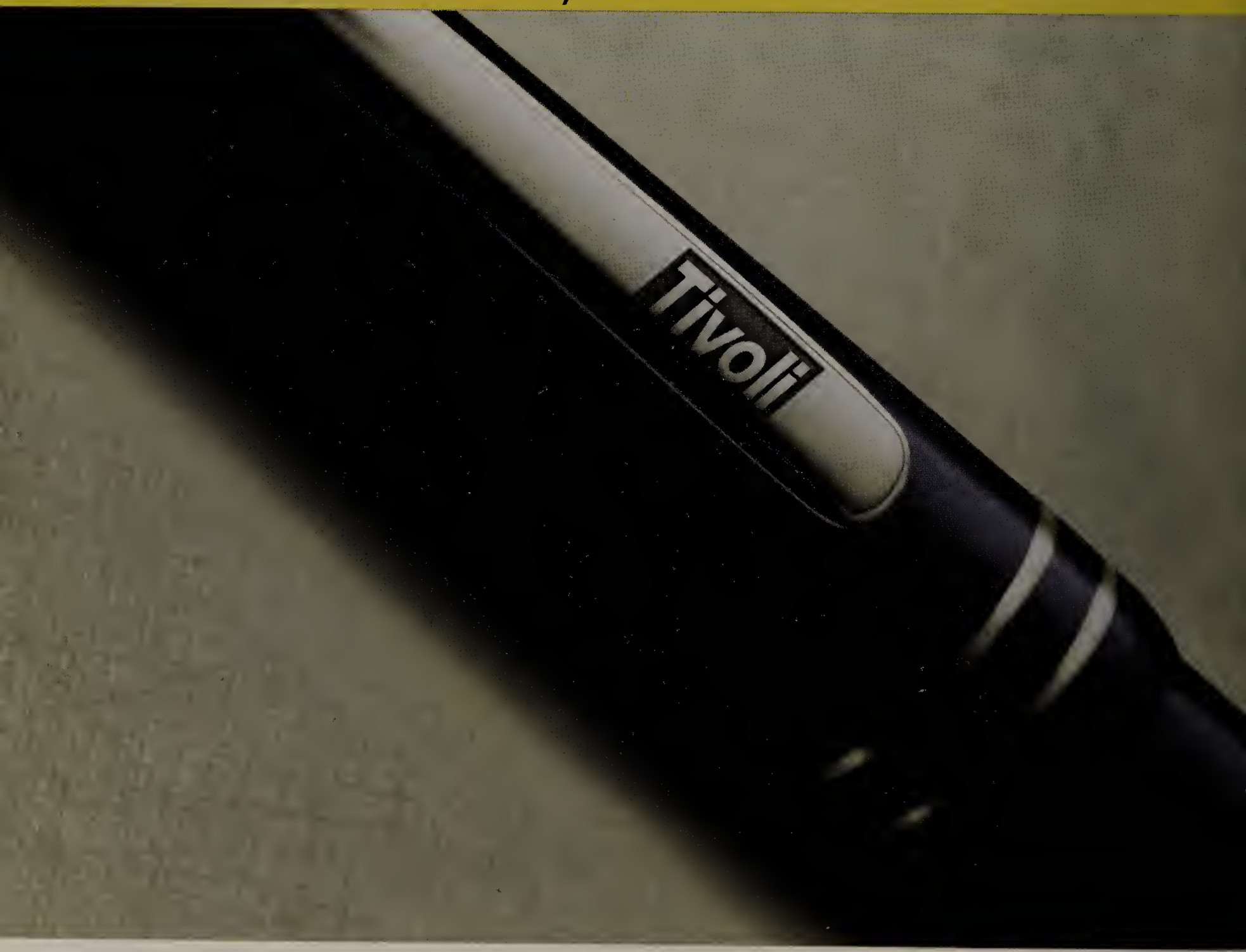

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